RAILROAD GAZETTE

SATURDAY, NOVEMBER 25, 1871.

NARROW GAUGE DOUBLE BOGIE LOCOMOTIVE.

So much has been written in favor of locomotives with two trucks—to which Mr. Fairlie has given his name—in the European engineering papers, and so little is known experimentally about them on this side of the Atlantic, that we think the accompanying engraving will attract especial interest as being the first "double bogie" engine with a single boiler built in this country.

The construction of the engine will be apparent from a very casual inspection of the engraving, and as will be observed is similar to that of the engines designed by Mr. McDonnell, Engineer of the Great Southern & Western Railroad of Ireland, and illustrated in the RAILROAD GAZETTE of July 22 of the present volume. The details of the one are, however, English, while those of the other have been thoroughly Americanized, and show marks of Mr. Mason's good taste all over the engine. There are, however, several features in the design of the "Onward" which are peculiar. As in the other engines referred to, the driving-wheels and cylinders are on a truck or "bogie" frame, and are consequently free to turn around a center-pin and thus adjust themselves to the curvature of the track. On the engines of Mr. McDonnell this center-pin is attached to the main frame of the engine. On Mr. Mason's engine it is held by a cast-iron saddle fastened to the boiler. The latter must, therefore, serve as the main frame. While this may be quite practicable for so small an engine as the one we illustrate, it is obvious that the shocks and strains of a larger locomotive would be very destructive to the boiler, and therefore on larger machines Mr. Mason intends to attach the center-pins of the trucks to a main frame extending from the one to the other, and nearly the whole length of the engine.

Of the merits of this plan of engine we have taken occasion to speak heretofore. There are some advantages which it possesses which are peculiarly adapted to narrow-gauge roads. One difficulty about the construction of engines for such lines is, that the space between the wheels and frames is too contracted for the fire-box. In the above plan its width is entirely independent of the wheels and frames, and therefore can be made as wide as it is desirable. This will be an advantage on any gauge less than five feet.

The "double bogie" will also enable the engine to run equally well either way on a straight or curved track, an advantage which is quite important for short and frequent runs, and which has of late been much needed in roads doing a heavy suburban passenger traffic.

It will be seen that the distribution of weight and parts of this engine is the same as on the plan designed by Mr. Forney, and which we have heretofore illustrated. They both possess the same advantages resulting from such a distribution, which are, a very material reduction of the dead weight and cost of engines, as compared with those ordinarily used in this country. Persons who have not estimated it have no idea of the amount of dead weight which pertains to ordinary locomotives. This was clearly shown in a paper read before the Society of Practical Engineering at their meeting in last March, and published in full in the RAILROAD GAZETTE of April 8, and from which we quote:

"An ordinary eight-wheeled locomotive, with four drivers and a truck 16x24 in. cylinder, weighs, in working order, exclusive of the tender, 60,000 lbs., of which 40,000 lbs. is carried by the driving wheels, and is barely sufficient for producing the requisite adhesion of the wheels to the rail, and therefore cannot be counted as *dead* weight, although it is non-paying. The remaining 20,000 lbs. is carried on the truck. The tender of such an engine will weigh 20,000 lbs. empty, and will carry 1,800 gallons of water and three tons of coal, making a total weight of 41,000 lbs. As the supply of fuel and water varies very much—the tank being sometimes full, but very seldom empty—it would be fair, we think, to count two-thirds of the water and coal as the average weight carried. Therefore, the average weight of the tender will be 34,000 lbs., which added to that on the truck of the engine, would make the *total dead* weight of the locomotive and tender 54,000 lbs. An ordinary loaded freight car weighs 40,000 lbs., so that an average train of 25 cars, including the weight of the engine and tender, will weigh 1,694,000 lbs., and consequently the dead weight of the locomotive will be a little less than 5 per cent. of the total weight of the train, and therefore that proportion of the wear to the track is due to the superfluous—if the word is admissible in this connection—dead weight of the locomotive and tender. With passenger trains the proportion is still greater. For comparison, the weight which has just been given by the Superintendent of a leading Western railroad will be taken:

Locomotive and tender	94,000 lbs.
Mail car	32,000 "
Baggage	36,000 "
1 coach	36,000 "
1 coach	38 000 "
70 passengers	9,800 "
Mails	2,000 "
Baggage and express	10,000 "
Making a total of	257,800 lbs.

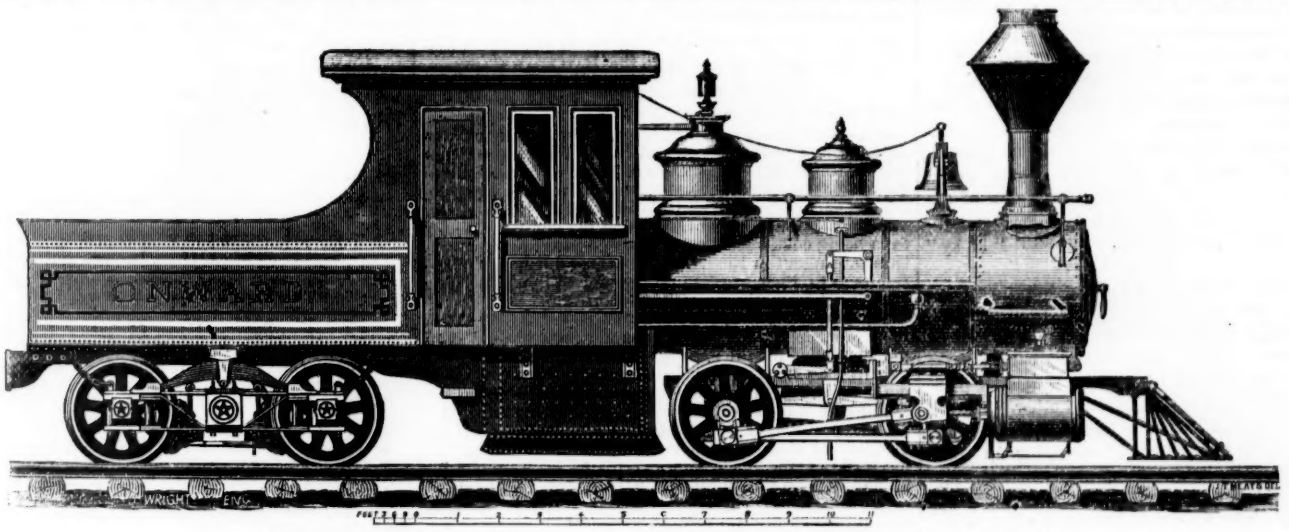
So that the *dead weight* of the engine and tender is more than 20 per cent. of the total weight of passenger trains, and *that* proportion of the wear and tear which the track sustains from passenger traffic must be attributed to the dead, or, perhaps more accurately the non-adhesive, weight of the locomotive and tender."

Now, an engine of the plan which we illustrate, of the same capacity as an ordinary 30 ton engine, with 16x24 inch cylinder, would weigh, with about two-thirds of a full supply of fuel and water, about 64,000 lbs., of which from 42,000 to 44,000 would be on the driving-wheels, and 20,000 lbs. on the truck or dead; so that its dead weight will be less than 2 per cent. of the weight of freight trains, and less than 9 per cent. of passenger trains, instead of 5 and 20 per cent., as was shown is the proportion with ordinary engines. That such a reduction of dead weight would result in a very perceptible economy in the cost of operating a road equipped with such engines we think needs no demonstration.

There is an advantage in the use of the above application of the double bogie system to engines of a large capacity, which is not so important where they are of smaller size and used on roads of the usual degree of curvature, and are not required to run both ways. It is well known that an ordinary locomotive, with the two driving axles rigid in the frames, will pass around curves of 600 feet radius with sufficient ease, if the total wheel base does not exceed from 22 to 24 feet in length. Of course, if the radius of curvature is less than 500 or 600 feet, a shorter wheel base is requisite. There are, however, very few roads of the ordinary gauge which now have curves of shorter radius than 600 feet. If, however, it is desirable to construct an engine for such a road the weight of which would be too great to carry on four driving-wheels, and which would require a grate more than five feet long, it will be found that the wheel base must be considerably longer than 24 feet, especially if the driving-wheels are more than four feet in diameter. If on such an engine the double bogies are used, the wheel-base can be extended indefinitely and the fire-box made as long—and as wide—and the driving-wheels as large as may be desirable. Inasmuch as a large grate is one of the requisites in the economical combustion of coal, the advantage which the double bogie system gives in that respect alone is very great. At the same time it allows as much space as may be required for the fireman and engine-runner between the tank and the fire-box, the want of which is a very serious objection to Mr. Fairlie's double-boiler locomotives.

The plan which Mr. Mason has embodied in the "Onward" seems to possess all the advantages for ordinary traffic which are claimed for the double-boiler engine, and with none of the disadvantages of the latter, excepting, perhaps, such as may be incident of the use of the flexible truck and steam-pipes, if there should be—but as we are told there is not—any difficulty experienced in their use.

The performance of this engine will be watched with much interest after its completion.



Narrow-Gauge Double-Bogie Locomotive, Designed by Wm. Mason, Taunton, Mass.

The German Valley Railroad.

The Trenton *State Gazette* has the following history of the railroad trouble in New Jersey, which is just now attracting considerable attention:

"Under the unpretentious title of 'Thompson *vs.* German Valley Railroad,' a most important suit has been commenced in the Court of Chancery in this State. The suit involves immense pecuniary interests, interesting constitutional questions, and, to some extent, the official conduct of the Executive of the State. Briefly the case is as follows: A bill was passed by the Legislature last winter, entitled 'An act to incorporate the German Valley Railroad Company,' giving a company almost unlimited privileges in the way of railroad building in this State. Among other franchises which this act confers, is full authority to construct a road from New York to Philadelphia, to bridge and cross all intersecting streams, for the condemnation of land over a large extent of territory, for the consolidation of all of its property and privileges with any other corporation in or out of the State, and other powers equally liberal and unusual for this hitherto remarkably conservative State in railroad legislation. These generous provisions were couched in language so diplomatic, and so cunningly hidden under the mists of transcendental phraseology, as to altogether elude the keen scrutiny of our worshipful legislators.

"In course of time an assessment of stock was made and called in, and Mr. Thompson, one of the stockholders, refused to pay his assessment, on the ground that the bill had not become law. He could not find any such act among the pamphlet laws, there was record of it in the Secretary of State's office, and no assessment had been paid to the State Treasurer. He accordingly brought this suit in chancery, to restrain the company from collecting the assessment of his stock. In the course of the proceedings Mr. Thompson summoned Governor Randolph to appear and testify and produce the bill. The Governor decined to appear. He was summoned again, and again declined. The party then obtained an order from the Chancellor summoning Mr. Randolph to show cause why he should not respond to the order of the Master, to give testimony and produce the papers. The order was returnable yesterday, and Governor Randolph replied, through Mr. Cortlandt Parker, that he should decline to appear, on the ground that the Court of Chancery was not the proper tribunal in which to bring him to account for his official conduct. That all his knowledge of the case is official in character, and that for his official acts he can only be brought to account by impeachment.

"The bill was taken to the Governor, as appears by the Assembly minutes, on the 30th of March. The Legislature adjourned on the 6th of April.

"The Governor also states that he had caused a copy of the bill to be placed in the office of the State Librarian, subject to the Chancellor's order and his own.

"The counsel for the complainant yesterday obtained an order from the Chancellor to inspect the bill, and they found appended to it a statement from the Governor to the effect that he had signed the bill but afterward erased this signature.

"The subsequent developments of this interesting case promise to be of a still more startling and remarkable character. "The German Valley Railroad Company, we may whisper, is the National Railway project under another name, and a different character."

Contributions.

Explosion of a Locomotive Boiler—The Old Story Again—Work for the Master Mechanics' Association.

"*The boiler was 20 years old and had just been patched!*" So says an account of the recent explosion of a locomotive boiler at Portsmouth, Ohio, and this is but a repetition of the old story: "The boiler had recently undergone thorough repairs." In a majority of cases these "thorough repairs," translated into plain English, mean that *a boiler already weakened by age and bad usage is further impaired by patching.*

The account of the explosion at Portsmouth is from a local paper, and is doubtless reliable. At all events, anyone, in writing the particulars of the explosion of a locomotive boiler, will run no risk of misstating the facts ninety-nine times out of one hundred in concluding with the words in the first line of this article. We rarely hear of the explosion of a new boiler, or one that is known or supposed to be sound, although there is an occasional instance of explosion when it is difficult to assign a reason therefor, and for which no one may in reason be blamed. It is rather a hard matter to charge a person possessed of the necessary qualifications to entitle him to occupy the position of a railroad master mechanic with willful neglect, ignorance or carelessness, on occasions similar to the affair at Portsmouth, and it also requires a considerable stretch of conscience to say that no one is to blame.

There can be no real necessity at the present day of great machine shops and remunerative traffic for running a boiler a single trip after it is known to be unsafe; but the frequent explosions of aged shells is a pretty sure indication that "there is a screw loose somewhere." It might be considered an extravagant assertion to say that, in seventy-five cases of boiler explosions out of every one hundred, some one is to blame. Some of our oldest roads, employing a large number of locomotives, have never lost a boiler by explosion. Some would call this "good luck," but a careful inspection of the scrap-heap would suggest that when a boiler "came to patching" it was "played out" on these "lucky" roads.

If some of our roads can get along thirty years or more without loss of life or limb or property from boiler explosions, it is singular that others may not be equally fortunate. The same care and treatment that insure safety in one section of country should, if practiced, be attended with like results in any other. The old dodge of relieving all parties concerned of all blame in cases of boiler explosions, by trumping up some mysterious cause, is no longer of any avail; and the fact that blame *should* rest somewhere is becoming every day more apparent. The public is becoming alive to the fact that a reform in the management of steam boilers is necessary, but how to bring about this much needed reform is a problem not easily solved.

It has been suggested that if the present system of government inspection of steamboat boilers was extended to locomotives, it would result beneficially; but inasmuch as such disasters as that of the "Westfield" is one of the results of that system as it is now conducted, it is better to dispense with the system altogether than to extend it. This is a matter that properly belongs to the Master Mechanics' Association to handle, and if that body gives the subject the attention its importance demands we shall hear of fewer explosions of ancient boilers "recently patched." Any member of that Association who would knowingly allow an unsafe boiler to be used should be adjudged guilty of a misdemeanor and punished or properly dealt with. It would be difficult in some cases of explosion to ascertain the real facts in the case, but if the Association be divided into sections or divisions, with a committee or examining board in each division, for the purpose of ascertaining the real cause of explosions, they might, in most cases, arrive at the facts of the case, when measures could be taken to prevent a similar occurrence in the future. Of course reference is had to such cases as might, in the opinion of the committee (or inspectors), have been prevented by proper care and good management on the part of those in charge of the boiler. It would be necessary, in order to receive any benefit from this arrangement, for the inspectors of the division in which an explosion occurred to be notified immediately to enable them to visit the scene of disaster as soon after its occurrence as possible. By ascertaining whether the boiler was properly constructed, the length of time it had been in use, the quality and condition of the plates at the points of fracture, the nature of the water used, what means were used for preventing scale, and matters of whatever nature having any bearing in the case, the blame in such cases might be properly placed. Then by preparing a full statement of the case to be reported to the Association at its annual session, together with portions of the fractured plate for the examination of the men of science who have been or may be admitted to membership, those gentlemen may make themselves exceedingly useful. These "division inspectors" might also do a good thing by reporting every boiler in their department over the age of 15 years, as to its condition, etc., and order the discontinuance in use of all such as may be deemed unsafe. The Master Mechanics' Association would of course need the power to enforce such rules and regulations as they may deem necessary to insure safety; and the power can, no doubt, be had for the asking. Any such arrangement would increase the labors of the Association, and it would also add greatly to its usefulness, which we may reasonably suppose is the principal object of such an organization. It is hoped that no member of the Master Mechanics' Association will take offense at these suggestions, as it is not intended to meddle with their affairs, further than to ask them to extend their labors in this direction as far as consistent and within their province. The public will certainly feel grateful for any exertions the Master Mechanics' Association may make to insure our lives and property, as far as possible, from destruction by boiler explosions. If our master mechanics are not the proper ones to take this matter in hand, to whom shall we appeal?

WM. S. HUNTINGTON.

The Russian Narrow-Gauge Railroads.

The following letter, which was addressed to General George P. Buell, Chief Engineer of the Texas Pacific Railroad Company, in answer to some inquiries, gives some interesting information concerning the Russian narrow-gauge railroads lately constructed, of which Mr. Fairlie has spoken in a letter to the RAILROAD GAZETTE:

ST. PETERSBURG, 13th September, 1871.

G. P. Buell, Esq., New York:

SIR—Your much esteemed favor of the 3d August was duly received by the Minister of Public Works, the Count Alexis Bobrinsky, and His Excellency has charged me to give you as requested every possible information regarding the narrow-gauge railroads in Russia. I must, however, regret that the information at my command is far from being complete, the two narrow-gauge railroads existing at present in Russia being but just finished, and the results as to their working power and working expenses are not yet correctly ascertained.

The Novgorod line, 3ft. 6in. gauge, 68 versts (45¼ miles) long, is constructed in a flat country, and being principally intended for the passenger traffic, is supplied with a light rolling stock and engines, built on the same principle as those generally used on all railroads of Europe.

The cost of construction of this line amounted to 18,000 roubles, paper,* per verst (27,000 roubles per mile). This line, having nothing particular in its construction except the width of the gauge, can contribute little to our information upon the question of narrow-gauge railroads.

The Imperial Livny Narrow-Gauge Railroad has been constructed by the Russian government in order to ascertain the true working and advantages of the narrow-gauge system of railroads, and a line of country has therefore been chosen presenting great difficulties for railway construction.

The Livny Railway, 3ft. 6in. gauge, is 57½ versts long (38.15 miles). About midway, near the station Russky-Brod, the line crosses the river Linborsha by a bridge of 420 feet long and 45 feet high; at this point the horizon of the rails is 353 feet lower than the horizon of the rails at the end stations. The steepest gradient admitted on the line is one in eighty; the entire length of gradients, in general, from $\frac{1}{100}$ to $\frac{1}{80}$, is 14½ miles. The length of the one in eighty gradients is 5½ miles in one direction and 4 miles the other. There are fifty-five curves on the line. The sharpest of these has a radius of 686 feet. The whole length of the curves is of 5½ miles. The bridges are fifty-two in number. The largest is 504 feet long and 80 feet high. All the bridges are built of timber on the Norwegian principle.

The rails are 20 feet long, 4 inches high, weighing 45 lbs. to the yard. They are laid on nine sleepers. All the buildings, except the engine-sheds and workshops, which are built of bricks, are constructed of timber. There are five stations on the line. The rolling stock consists of two tender engines (17 tons empty), five double-bogie Fairlie engines (35½ tons empty and 46 tons in working order), seventeen passenger carriages and two hundred and sixty-six goods wagons. The tare weight and lifting capacity of the wagons are as follows:

	English.					*Net Load.*			
Tare.	*T.*	*cwt.*	*q.*	*lb.*		*T.*	*cwt.*	*q.*	*lb.*
Platform, 105 lbs.	(1	13	3	0)	870 lbs.	(5	19	1	12)
Open wagon, 125 lbs.	(1	17	0	20)	360 "	(5	16	0	16)
Closed wagons, 140 lbs.	(2	1	3	26)	340 "	(5	9	2	24)
Break van, 270 lbs.	(3	19	3	0)	250 "	(4	0	2	14)

A train of fifty wagons weighs on an average 350 tons, the net weight being 242 tons in working order.

A Fairlie engine running with a goods train at a rate of 10 miles an hour uses 3.03 cubic feet of wood fuel per mile; there is room on the engine for 320 cubic feet of wood fuel, 198 cubic feet of water in the tanks, and 130 cubic feet in the boiler.

At the last trials in August a Fairlie engine, pressure of steam not exceeding 140 pounds, has taken without stopping a train of 61 loaded wagons, gross load 410 tons, at a rate of ten miles an hour, from Russky-Brod to Verchovie, which is the part of the line where the maximum up-hill gradients are mostly situated. The length of the train, exclusive of the engine, was 896 feet. The construction of the Livny line has cost about 25,500 roubles per verst (paper) (38,250 roubles per mile). From this price about 7,000 roubles per verst were employed for the purchase of the rolling-stock.

No railway of 3 feet gauge has been as yet built in Russia, the Commission which was named in 1870 for studying the narrow-gauge railways having found 3ft. 6in. preferable to 3 feet gauge.

Trusting that the foregoing information will prove useful to you, I have the honor to remain, sir,

Your most obedient servant,

B. SALOFF,

Chairman of the Board of Management.

LADISLAS DE KLUPFFELLE, Secretary.

P. S.—There is actually a third narrow-gauge railway (3ft. 6in.) building from Taroslav to Vologda, 200 versts (134 miles) long, which is expected to be finished during this winter. The cost of the building of this line will amount to 19,500 roubles net cash the verst.

A special commission is appointed now for studying the question of narrow gauge on cheap railways in Russia and fixing the preferable gauge and mode of construction for different application.

I would be very grateful to you for forwarding a copy of the present letter to the New York RAILROAD GAZETTE, which has treated, on the 19th August, the question of narrow-gauge railroads, and republished from the New York *World* some incorrect details about the Livny Railway.

I find myself bound to add that Mr. Robert Fairlie has never been Chief Engineer of the Russian Department of Narrow-Gauge Railroads, but acted only as Government Inspector for the building of the five engines of the Fairlie system at Sharp-Stewarts' works in England.

B. S.

LADISLAS DE KLUPFFELLE.

[We publish the above letter just as we have received it. The portion relating to the weight of cars is in a measure incomprehensible to us, and we are unable to make out what is meant by "tare" in the connection in which it is used; or, in fact, tell with any certainty what is the weight or carrying capacity of the cars.—EDITOR RAILROAD GAZETTE.]

* A paper rouble is equivalent to 65 cents in American coin.—ED. RAILROAD GAZETTE.

THE AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.

Official Report of the Fourth Annual Convention, Held in Louisville, Ky., September 12, 13 and 14, 1871.

[CONTINUED FROM PAGE 339.]

REPORT ON STEEL TIRES, WHEELS AND AXLES.

The President—The next business in order is the report of the Committee on Steel Tires, Wheels and Axles. Which was read by the Secretary.

To the American Railway Master Mechanics' Association:

GENTLEMEN: The Committee to whom the subject of Steel Tires, Wheels and Axles, also Chilled Tires, was referred, have given the matter their attention, and make the following report, assuming that the duties of the Committee are similar to what they have been in preceding years—to collect facts and faithfully present them.

Acting upon that assumption they prepared a series of interrogations bearing upon the subject, requesting replies from all the master mechanics of the country. The questions were as follows, viz.:

1st. How many steel wires, and of what manufacture, are in use upon your road?

2d. Please furnish detailed report of the performance of each set, stating the number of the set, thickness when fitted for use, present thickness, mileage, diameter of wheel, weight of engine, and nature of service.

3d. Have any steel tires broken while in use on your road?

4th. Please furnish a statement of circumstances attendant upon such breakage, the season of the year, the mode in which the tire was secured, the amount of shrinkage, when set, the nature of fracture, and extent of the damage in consequence thereof.

5th. Have any steel wires on your road been removed from wheels on account of being worn so thin as to be considered unsafe? If so, of what thickness were said tires when removed, and what indications caused you to doubt their safety?

6th. Is the location of your road such as to make your tire service particularly severe on account of heavy grades or extremely cold weather?

7th. What do you consider as the best method of fastening steel tires to the wheels, and what rate of shrinkage do you allow in setting?

Chilled Tires.

8th. How many chilled tires, and of what manufacture, have you in use on your road?

9th. Please furnish detailed report of the performance of each set, mileage, diameter of wheel, weight of engine and nature of service.

Wheels.

10th. How many steel wheels, and of what manufacture, are in use on your road under engines or cars?

11th. In your experience how do steel wheels compare with those of iron in point of durability, safety and economy?

Answers to these inquiries have been received from twenty-six roads. Some of them were very full and to the point. A few were not answered in such a manner as to be available for the purpose of your Committee on account of important items of information.

The Committee return their thanks to all who have favored them with replies.

Steel Tires.

It appears by statements furnished by the agents of the leading manufacturers that there have been sold of

Krupp's, up to May 1, 1871	19,428 tires.
Vicker's, " " "	10,857 "
William Butcher's, up to August 1, 1871	11,565 "
Firth's, up to May 1, 1871	6,115 "
Total	47,995 "

The total sales for the year 1871 were 8,973 tires, showing a

*The Firth Tire was designated in the returns as follows, viz.:

Firth's English	6 Sets.
Firth's Nashau	13 "
Firth & Son's	5 "
Firth's	136 "
†Butcher's English	5 "
William Butcher's Philadelphia	31 "
Butcher's	49 "

slight increase over last year (1870), which were 8,854 tires, by the same agents.

These figures, however, do not represent by probably some thousands the whole number of steel tires that have been sold in the country.

The opinions presented in the returns made to the inquiry of the Committee have been carefully examined with reference to the point referred to, and they have endeavored to give a correct deduction from the facts before them.

The whole number of sets of tires reported is			1,305
The whole number of tires			5,410
Number of Krupp's manufacture	Sets, 427	Tires, 1,808	
" Vicker's "	" 244	" 984	
" Firth's* "	" 160	" 640	
" Butcher's† "	" 85	" 390	
" others "	" 389	" 1,588	
Total	1,305		5,410

Of the whole number of tires reported in the returns to the Committee we find details of the performance of only 653 sets, viz.: Krupp's, 236; Vicker's, 181; Firth's, 90; Butcher's, 42; Washburn's, 4; French, 73; Bessemer, 10; Low Moor, 6; Taylor's, 7; others, 4.

The statements representing the performance of the first four manufacturers of tire named above may be found arranged in tabular form at the end of this report. (See Table 2.)

The report of the performance of the others named above may be found in their regular order below. From those that we have the details of we derive the following results for tires of all kinds collectively:

Average of miles run to 1-16 inch wear	14,658
Highest average on any road to 1-16 inch wear	26,151
Lowest " " " " " "	9,199
Highest run on any single set, 1-16 inch wear	123,347
Lowest " " " " " "	1,081

A digest of the statements of the returns, with respect to the performance of tires of different manufacture, will be found in Table 2, attached to the report, from which we derive the following result, viz.:

Krupp's Tires—Average of miles run to 1-16 inch wear		15,150
	Highest average on any road to 1-16 inch wear	49,704
	Lowest " " " " "	9,199
	Highest run of single set to 1-16 inch wear	123,347
	Lowest " " " "	2,671
Vicker's Tires—Average of miles run to 1-16 inch wear		17,983
	Highest average on any road to 1-16 inch wear	46,122
	Lowest " " " "	8,180
	Highest run of single set to 1-16 inch wear	79,661
	Lowest " " " "	1,081
Firth's Tires—Average of miles run to 1-16 inch wear		15,463
	Highest average on any road to 1-16 inch wear	31,674
	Lowest " " " "	9,346
	Highest run of single set to 1-16 inch wear	78,225
	Lowest " " " "	2,038
Butcher's Tires—Average of miles run to 1-16 inch wear		14,685
	Highest average on any road to 1-16 inch wear	38,237
	Lowest " " " "	6,855
	Highest run of single set to 1-16 inch wear	38,237
	Lowest " " " "	6,855
French Tires—Average of miles run to 1-16 inch wear		11,029
	Highest run of single set to 1-16 inch wear	30,170
	Lowest " " " "	4,239
Bessemer Tires—Average of miles run to 1-16 inch wear		12,129
	Highest run of single set to 1-16 inch wear	15,718
	Lowest " " " "	10,137
Taylor Tires—Average of miles run to 1-16 inch wear		16,802
	Highest run of single set to 1-16 inch wear	55,522
	Lowest " " " "	10,137
Low Moor Tires—Average of miles run to 1-16 inch wear		7,220
	Highest run of single set to 1-16 inch wear	15,943
	Lowest " " " "	1,579
Washburn Tires—Average of miles run to 1-16 inch wear		12,557
	Highest run of single set to 1-16 inch wear	15,635
	Lowest " " " "	8,452

Of the last five named manufacture of tires there were reported as follows, viz:

French	73 Sets.
Bessemer	10 "
Taylor	7 "
Low Moor	6 "
Washburn	6 "

Of the French tire, the New York Central & Hudson River Railroad, New York Central Division, reported sixty-nine sets. Cleveland, Columbus, Cincinnati & Indianapolis, Eastern, Lake Shore & Michigan Southern, Rome, Watertown & Ogdensburg, have one set each.

Of the Bessemer, the Buffalo, Corry & Pittsburgh have six sets; Cleveland, Columbus, Cincinnati & Indianapolis, three sets, and Rome, Watertown & Ogdensburg have one set.

Of the Taylor, the Flint & Pere Marquette reports three sets; Cleveland, Columbus, Cincinnati & Indianapolis, one set; Rome, Watertown & Ogdensburg, one set; Lake Shore & Michigan Southern, two sets.

Of the Low Moor, the Memphis & Charleston reports two sets; Pittsburgh, Fort Wayne & Chicago, three sets; Rome, Watertown & Ogdensburg, one set.

Of the Washburn, the Cheshire reports three sets; New York Central & Hudson River, New York Central Division, one set; Illinois Central, two sets.

These statistics, as will be seen, show great difference in the performance of single sets of tire, and in the average on different roads, both in regard to the work of all kinds of tire taken collectively, and in those of same manufacture.

The committee have given the figures as they find them, though confident that there must have been inaccuracy in some cases.

The average miles run to the sixteenth inch wear are reduced from those of last report.

Last report, general average, 15,868 miles to the sixteenth inch wear. This year it is 14,658 miles. Average for Krupp's last year, 17,613; this year, 15,150. Average for Vicker's last year, 14,039; this year, 17,983. Firth's last year, 16,110; this year, 15,463. Butcher's last year, 13,835; this year, 14,685 miles.

For the purpose of giving a condensed view of the wear of steel tires that have been longest in use, we have taken all of those reported put on previously to 1866, amounting to twenty-seven sets, and about equally divided between passenger and freight service, and in use under engines averaging in weight twenty-eight tons, and arrive at the following result:

General average	15,334	miles to 1-16 inch wear.
Krupp's Tire—9 sets average	16,716	" " "
" " Highest run one set	31,697	" " "
" " Lowest " "	5,422	" " "
Vicker's Tire—14 sets average	15,946	" " "
" " Highest run one set	79,661	" " "
" " Lowest " "	6,903	" " "
Butcher's Tire—3 sets average	15,080	" " "
" " Highest run one set	18,697	" " "
" " Lowest " "	10,811	" " "
Campbell's Tire—1 set run	9,399	" " "

We give below a few sets to show the extremes to 1-16 inch wear. One set is reported to have run 123,349 miles; another, 57,555 miles. Of some of the lowest runs to the 1-16 inch are the following, viz.: One set, 1,081 miles; another, 2,038, and another, 2,671 miles. In a few instances tires were returned without any loss in thickness, with several thousand miles to their credit.

Your Committee have endeavored in the foregoing record to present the information to be derived from the returns, believing that the result obtained from experience would be more acceptable to you than any opinion that we might advance.

It would hardly be expected that we could arrive at any correct conclusion as to the amount of work that may be expected of steel tires, as none are yet reported worn out, and the general average of miles run to the sixteenth inch wear shows by the report a decrease as the tire wears away, and may continue to do so in any increased ratio in the future. Neither can we tell from information in our possession how thin a tire may be run with safety. We, therefore, prefer to present the statements and leave them for you to draw your conclusions as your judgment may dictate.

Breakage of Tires.

As is shown in table 1, the number of tires reported broken since last report is as follows, viz.:

Krupp's	1
Vicker's	11
Firth's	1
Butcher's	5
Others	5
Total	23

Atlantic & Great Western broke four in December, 1870. All secured by set screws 1-100 inch shrinkage to one foot diameter of wheel. Fractures showed bad material. The record was as follows, viz.:

One put on October, 1866, broke December 25, 1870; run 114,404 miles; 1⅛ inch thick when it broke. Krupp's make.

One put on March 10, 1866: broke December 25, 1870; run 125,468 miles; thickness when broken 1⅛ inch.

One put on July, 1868; broke December 24, 1870; run 37,408 miles; was 2 inches thick when broke. The last two were Butcher's make.

One put on February, 1865; broke December 22, 1870; run 137,493 miles; thickness when broken 1½ inch. Vicker's make.

Lehigh Valley Railroad reports two Butcher's and four Campbell's tires broken; all English; shrunk on without set screws. No details.

Boston & Providence Railroad.—Three tires broken, all in winter. Two were set on wood, and the damage was not great. The others set on iron, the damage slight. Amount of shrinkage not known. Put on by builders. The above were Vicker's tire.

Eastern Railroad.—One tire broke in winter into three pieces, directly across. Of very fine grain, perfectly homogeneous. Damage very slight. Vicker's make.

Maine Central Railroad.—One tire broken since last report (two in all). Vicker's make. The last one in spring of 1871. Secured by set screws. Shrinkage 1-20 of an inch to a five-foot wheel. Fracture, a split lengthwise. Damage slight.

Lake Shore & Michigan Southern Railway.—One Butcher tire broken. The Master Mechanic informs us it was caused probably from being set too tight, by mistake. One Firth tire on same road. No cause stated. Damage small. Secured by set screws.

North Pennsylvania Railroad.—One Campbell & Co. tire broken in cold weather. Shrunk on and secured by set screws. Put on by builders. Amount of shrinking not known. Broke with a fracture square across the tire. No damage to machinery.

Illinois Central Railroad.—Three tires broke since last report. All Vicker's make. One February 10, 1870. Crack extended two inches from outer edge of tire toward middle of tread, and then lengthwise fifteen inches. Had run 87,528 miles. One broke January 27, 1871, straight across; had run 113,338 miles. One broke April 6, 1871; cracked through the flange to near middle of tread and lengthwise about eighteen inches. Had run 154,476 miles. No damage to engine or train from any of these breaks.

Pittsburgh, Fort Wayne & Chicago Railway.—Two tires have broken since last report. They were put on May 4, 1866. Original thickness 2⅛ inches. One broken December 23, 1870; the other January 3, 1871. They had run 125,146 miles, and were 1⅛ inches thick when broken. The weather was very cold. A clear break, no sign of flaw. Secured to center by set screws; amount of shrinkage was the thickness of letter paper. No damage to machinery. Tire of Vicker's make.

Removal of Tire.

There are but two cases reported, and these are as follows:

Atlantic & Great Western Railroad.—One set removed 1⅛ inch thick. No dangerous indication, but considered too thin for safety, on account of frost and unyielding nature of track.

Vermont Central Railroad.—Two sets removed on account of being thin, 1⅛ inch thick. Not considered unsafe, but removed on account of wheel center being light and liable to break. Thought it economy to save the centers by putting on new tires. Location of the road severe on tires; heavy grades and excessive cold weather.

Setting and Fastening.

We have replies on these points from twenty-four roads.

12 use shrinkage alone.

7 use shrinkage and set screws.

3 use wooden blocks.

1 bores the tire nearly through, leaving a shoulder on the outside to bear against the cast iron, and roll or hammer down the inside of tire over the edge of the cast iron wheel center.

1 road uses 1-10 of an inch to a four feet wheel shrinkage.

1 uses 1-32 of an inch to a 5 foot tire and 1-20 to a 5 foot.

1 uses 3-63 of an inch to a 5 foot and 1-16 inch to a 5½ foot.

1 uses 1-24 of an inch to a 63 inch wheel.

13 roads use 1-20 of an inch to a 5 foot tire.

The above are all the reports received on the amount of shrinkage.

Chilled Tire.

Hannibal & St. Joseph Railroad.—Report one set chilled tire (4) used under a 28 ton engine, tire 52 inches in diameter; run 164,306 miles. Worn out another set under a 24 ton engine, 54

TABLE No. I.

NAME OF RAILROADS.	NO. OF SETS OF STEEL TIRE AND MANUFACTURERS. Krupp's	Vicker's	Firth's	Butcher's	Others	Total	MILES RUN TO 1-16 INCH WEAR. No. of Sets Reported on.	Average run.	Highest run of Single set	Lowest run of Single Set.	NUMBER AND MAKE OF TIRE BROKEN. Krupp's	Vicker's	Firth's	Butcher's	Others	Total
Atlantic & Great Western	3	....	....	....	....	3	3	26,151	30,702	20,435	1	1	....	2	....	4
Buffalo, Corry & Pittsburgh	....	....	....	....	....	6	6	14,551	15,718	12,450	....	....	....	....	....	....
Boston & Providence	....	....	....	....	....	25	25	....	....	....	....	3	....	....	....	3
Cumberland Valley	5	1	....	4	....	10	10	20,654	46,122	11,294	....	....	....	....	....	....
Cleve., Col., Cinn. & Indianopolis, Columbus Div.	18	8	1	2	3	32	32	20,092	57,155	9,064	....	....	....	....	....	....
Cleve., Col., Cinn. & Indianopolis, Ind. Division	9	13	1	6	2	31	19	23,657	123,347	10,628	....	....	....	....	....	....
Cheshire & Ashuelot	19	1	4	....	3	27	27	12,955	24,986	7,993	....	....	....	....	....	....
Eastern	9	17	15	4	1	46	46	11,407	78,225	2,662	....	1	....	....	....	1
Flint & Pere Marquette	1	....	13	2	4	20	16	11,081	55,522	2,038	....	....	....	....	....	....
Georgia Railroad	11	18	....	6	3	38	25	18,369	29,544	2,998	....	....	....	....	....	....
Hartford, Providence & Fishkill	6	....	....	....	4	10	2	9,199	11,915	8,294	....	....	....	....	....	....
Hannibal & St. Joseph	10	5	2	....	37	55	18	2[illegible]384	46,285	11,606	....	....	....	....	....	....
Illinois Central	92	45	....	14	14	163	76	10,011	25,267	4,500	....	3	....	....	....	3
Little Miami and Columbus & Xenia	18	12	5	1	....	36	23	13,091	35,147	4,247	....	....	....	....	....	....
Lake Shore & Michigan Southern	60	14	35	7	3	119	119	18,574	48,556	3,406	....	....	1	1	....	2
Lehigh & Bloomsburg	20	1	....	2	....	23	18	10,184	26,272	4,130	....	....	....	....	....	....
Lehigh Valley	31	2	....	19	3	55	55	....	....	....	....	....	....	†2	‡4	6
Maine Central	....	....	....	....	49	49	*	....	....	....	....	1	....	....	....	1
Memphis & Charleston	3	....	2	....	2	7	7	16,065	15,943	8,005	....	....	....	....	....	....
New York & Oswego Midland	....	....	....	....	22	22	....	....	....	....	....	....	....	....	....	....
New York Central & Hudson River, N. Y. C. Div.	49	25	17	....	129	220	127	12,041	75,661	4,230	....	....	....	....	....	....
North Pennsylvania	17	....	....	13	1	31	31	14,495	41,441	6,870	....	....	....	....	1	1
Pacific Railroad of Missouri	1	1	2	4	67	75	8	17,985	28,550	9,508	....	....	....	....	....	....
Pittsburgh, Fort Wayne & Chicago	8	67	6	....	3	84	84	11,508	78,324	1,081	....	2	....	....	....	2
Rome, Watertown & Ogdensburg	8	12	4	....	4	28	28	15,151	81,513	3,504	....	....	....	....	....	....
Vermont Central	26	4	42	1	4	77	77	....	....	....	....	....	....	....	....	....
Wilmington & Weldon	3	....	10	....	....	13	6	21,654	25,869	6,460	....	....	....	....	....	....
	427	244	160	85	389	1,305										23

*No details received. †2 English. ‡4 reported English.

TABLE No. II.

NAMES OF RAILROADS.	KRUPP'S TIRE. No. of Sets Reported on.	Average miles run to one-sixteenth inch of wear	Highest run to one-sixteenth inch of Single Set	Lowest run to one-sixteenth inch of Single Set	VICKER'S TIRE. No. of Sets Reported on.	Average miles run to one-sixteenth inch of wear	Highest run to one-sixteenth inch of Single Set	Lowest run to one-sixteenth inch of Single Set	FIRTH'S TIRE. No. of Sets Reported on.	Average miles run to one-sixteenth inch of wear	Highest run to one-sixteenth inch of Single Set	Lowest run to one-sixteenth inch of Single Set	BUTCHER'S TIRE. No. of Sets Reported on.	Average miles run to one-sixteenth inch of wear	Highest run to one-sixteenth inch of Single Set	Lowest run to one-sixteenth inch of Single Set
At. & Gt. Western	3	26,151	30,702	20,435	..	.....	.....	.....	..	.....	.....	.....	..	.....	.....	.....
B. C. & Pittsburgh	..	.....	.....	.....	..	.....	.....	.....	..	.....	.....	.....	..	.....	.....	.....
B. & Providence	..	.....	.....	.....	..	.....	.....	.....	..	.....	.....	.....	..	.....	.....	.....
Cumberland Valley	5	14,525	19,472	11,294	1	46,122	46,122	46,122	..	.....	.....	.....	4	38,237	38,237	38,237
C. C. C. & I., Col. Div.	18	46,813	57,555	9,064	8	29,264	31,555	13,412	1	31,674	31,674	31,674	2	16,707	15,416	15,416
C. C. C. & I., Ind. Div.	5	49,704	123,347	35,587	7	29,974	51,222	14,945	1	10,628	10,628	10,628	4	21,754	37,304	15,826
Cheshire & Ashuelot	19	13,467	24,986	9,735	1	11,149	11,149	11,149	4	11,497	24,268	7,993	4	11,497	24,268	7,993
Eastern R. R.	9	10,425	14,597	7,462	17	12,954	34,887	2,662	15	13,839	78,225	7,428	4	19,029	28,708	9,350
F. & P. Marquette	1	2,671	2,671	2,671	..	.....	.....	.....	10	13,966	32,088	2,038	1	12,457	12,457	12,457
Georgia	8	17,780	27,531	10,040	14	19,448	29,544	2,958	..	.....	.....	.....	1	25,950	25,950	25,950
H. P. & Fishkill	2	9,199	11,915	8,294	..	.....	.....	.....	..	.....	.....	.....	..	.....	.....	.....
H. & St. Jo	10	18,777	46,285	11,606	5	25,318	41,466	18,145	1	22,650	22,650	22,650	..	.....	.....	.....
Ill. Central	92	.....	.....	.....	43	.....	.....	.....	..	.....	.....	.....	14	.....	.....	.....
L. M. & C. & Xenia	8	18,068	25,585	10,965	10	8,180	27,364	4,274	5	26,639	35,147	19,658	..	.....	.....	.....
L. S. & M. S	60	16,675	48,556	6,066	14	17,695	24,625	8,092	35	21,564	28,029	3,406	7	16,604	17,864	14,144
L. & Bloomsburg	15	9,790	26,272	4,130	1	11,581	11,581	11,581	..	.....	.....	.....	2	11,789	18,697	6,855
Lehigh Valley	..	.....	.....	.....	..	.....	.....	.....	..	.....	.....	.....	..	.....	.....	.....
Maine Central	..	.....	.....	.....	..	.....	.....	.....	..	.....	.....	.....	..	.....	.....	.....
M. & Charleston	3	12 903	15,300	8,005	..	.....	.....	.....	2	.....	.....	.....	..	.....	.....	.....
N. Y. C. & H. R. N. Y. C. Div	33	13,569	31,697	9,074	23	17,872	79,661	9,199	1	.....	.....	.....	..	.....	.....	.....
N. Y. & O. Midland	..	.....	.....	.....	..	.....	.....	.....	..	.....	.....	.....	..	.....	.....	.....
N. Penn	17	16,586	41,441	7,895	..	.....	.....	.....	..	.....	.....	.....	13	11,560	21,171	6,870
Pacific R. R., Missouri	1	9,568	9,568	9,568	1	18,304	18,304	18,304	2	22,933	28,550	18,724	4	18,731	22,837	13,464
P. W. Ft. W. & C., W. Div	8	10,505	13,537	8,159	67	11,807	78,324	1,081	6	16,157	18,355	5,709	..	.....	.....	.....
Rome, W & O	8	15,932	81,513	8,374	12	16,237	47,371	8,962	4	14,600	28,868	7,949	..	.....	.....	.....
Vt. Central	..	.....	.....	.....	..	.....	.....	.....	..	.....	.....	.....	..	.....	.....	.....
W. & Weldon	3	21,089	25,869	12,893	3	9,346	11,882	6,460	..	.....	.....	.....	..	.....	.....	.....

inch tire; have run 95,088 miles; half worn out. Tire screwed to center by taper bolts. Used on construction.

Cleveland, Columbus, Cincinnati & Indianapolis, Columbus Division.—12 sets, 10 of which are secured to center with gib bolts; 2 sets with taper and bolts. Engines used on constructions, wood and switching. One tire removed; chill worn through; mileage, 92,560. One set nearly worn out; mileage, 73,330. Other in good condition, with an average run of 27,068 miles.

Memphis & Charleston Railroad.—Report 6 engines having chilled tire. Five of them are freight engines and one used on construction. Four have tire 58 inches in diameter and two have tire 56 inches in diameter. Reported as weighing about 27 tons each, with an average mileage of 41,847 miles. The tires are reported in good condition.

Pittsburgh, Fort Wayne & Chicago Railway.—Reports 12 sets chilled tires used on switching engines, with an average mileage of 72,218 miles. "In good condition."

Several roads have reported chilled tires without details, mostly in use on switching engines. The most common reply is that they "keep no details of chilled tires."

Steel Wheels and Axles.

The returns received give but very little material from which to make a report upon steel wheels. From all that have favored us with replies none speak in their favor. Most of them reply that they have not had sufficient experience to judge.

To the inquiry in relation to steel axles about half reply, "none in use."

Eastern Railroad.—Have 20 steel driving-wheel axles, and think they will fully justify the difference in cost compared with iron. Have no small axles in use.

Atlantic & Great Western Railway.—Reports 12 steel axles. Thinks that the durability and safety will not justify the difference in cost.

North Pennsylvania Railroad.—Have 40 steel axles, made by Naylor & Co., in use under passenger cars. The report says "good iron is preferable."

New York Central & Hudson River Railroad.—Have about 50 steel axles. Do not consider it economy to use steel axles under cars, but prefer them under engines for driving axles.

The replies to inquiries as to steel wheels and axles have not been as full as we could wish. In the replies as to car or small axles, the majority of answers are not in favor of steel. For driving-wheel axles, it appears from the returns that the majority of those that have had experience in their use are in favor of steel, and think them superior to iron.

Your Committee regret that in some cases the returns as to tires were not fully available on account of omission of important particulars, and will say we should have corresponded with the individual members upon the subject, but the shortness of the time after receiving full returns would not permit and give us time to complete our report and properly attend to our other duties. We would suggest, for the convenience of future committees upon this part of the business of the Association, that the returns to the Committee be made at least one month earlier, say by the first of July.

Respectfully submitted,

F. A. PERRY, Cheshire & Ashuelot.
JOHN E. WIGGIN, Boston, Hartford & Erie.
JAMES N. LAUDER, Northern of New Hampshire.
} *Committee.*

On motion the report was received and ordered to be spread upon the minutes.

DISCUSSION ON TIRES.

Mr. Hayes, Illinois Central Railroad—I would inquire whether those tires that were broken were not those that were perforated for set screws?

Mr. Lauder—I don't know whether that is the case or not.

Mr. President suggested that only one set were mentioned with set screws.

Mr. Hayes, Illinois Central Railroad—I would state that we have fifteen sets put on tapering in the same way. We put on the old chill tire. They are held on by set screws. Most of them have been running from two to six years, and in no case has one got loose, broken or stretched. I believe that putting them on tapering is the best way. There is no occasion for heating the tire or giving it any temper other than that given by the maker.

Mr. Towne, Hannibal & St. Joseph Railroad—I would like to inquire how much shrinkage they had?

Mr. Lauder—The report embodies all the information the Committee has upon the subject. I think in no case is the shrinkage given. If it was, it is embodied in the report. Some, in their communications to us, have said the shrinkage is unknown.

Mr. Towne, Hannibal & St. Joseph Railroad—I would suggest, Mr. President, that the Committee be instructed to confer with those parties and ascertain what the shrinkage was. In my opinion many more tires have been broken from too much shrinkage than otherwise. I know when they were first put on there were many more broken than now. We have three kinds in use. None of them have broken. We allow them uniform shrinkage. I do not approve the plan of using set screws.

Mr. Hayes, Illinois Central Railroad—What shrinkage do you allow?

Mr. Towne, Hannibal & St. Joseph Railroad—We allow a five-foot wheel one-twenty-fourth of an inch.

Mr. Hayes, Illinois Central Railroad—That is about the shrinkage we give our tires. Three of those given in that report were, I believe, broken upon our road. Two cracked longitudinally, and two were defective in the casting. They are cast in a mould and then hammered. But unless the casting is perfect, hammering will not make it so. I don't think the shrinkage had anything to do with the breakage. Certainly not with those that cracked longitudinally. We broke eight or ten of the "Butcher" tires; but they were "honeycombed," and I think that was the cause of their breaking.

Mr. Lauder—I would say that if we had had time after we received communications in answer to the series of questions sent out, we would have corresponded and asked many questions not embodied in this report. We would have ascertained all the particulars as to breakage, but our circulars were sent and replies requested by the first of August. Some of them we did not get till the first of September, which gave us but little time in which to make our report. We had no time to correspond with any one. I would suggest that hereafter replies to circulars be requested by the first of July; that will give us ample time.

Mr. Glass moved that a paper containing a statement of the running of engine "26" of the Alleghany Valley Railroad be appended to the report.

Mr. Hayes, Illinois Central Railroad, desired to hear from Mr. Ham, of the New York Central Railroad, as to the working of the French tire.

Mr. Ham, New York Central Railroad—It would be impossible for me to give you any information of the working of the French tire in detail. I think it does remarkably well. Some of them we have run twenty-five thousand miles, and in some cases as high as sixty-five thousand miles.

Mr. Sellars, Memphis & Charleston Railroad—I have the statement here that an engine on the Central Pacific run 153,820 miles on one turning. I notice in the report that the greatest run is 123,000. This engine run a fast passenger train 153,820 miles from the 17th of October, 1867, to the 14th of May, 1871. During the time she lost nine trips, but made eleven and a half extra trips, more than compensation for the time lost. It don't state whose tire it was.

Mr. Lauder—I don't think the report has anything to do with the extraordinary performance of tires. It simply gives the extraordinary performance of the engine as a whole. To speak of running an engine so many thousand miles before turning is a rather indefinite way of speaking of tires. The basis we went upon was the number of miles run to a given amount of wear. We took as an average one-sixteenth of an inch.

Mr. Glass—A great deal depends upon the nature of the road. This engine "26" had been running a light passenger train of five or six cars. If she had had a heavy freight train it is probable she would not have run so far.

Mr. Sellars, Memphis & Charleston Railroad—I think more depends upon the character of the road than anything else. In our country if we get fifty thousand miles out of a tire we are doing remarkably well; but an engine running one hundred and fifty-three thousand miles is beyond all precedent to us.

Mr. Setchell, Little Miami Railroad—If we place this case on the minutes it advertises the tire to some extent, and we don't propose to make this Association an advertising medium to blow up anybody's tire. If we do, we should have all the circumstances detailed, so we can judge whether that tire is really better than others or not.

The President—I would inquire of Mr. Glass whether this report was referred to the Committee on Tires?

Mr. Glass—No, sir, it was not. I don't know about the wear; but I do not think the tire was a sixteenth of an inch out of true.

Mr. Hayes, Illinois Central Railroad—I want to know whether Mr. Sellars' statement gives the thickness.

Mr. Sellars, Memphis & Charleston Railroad—It does not. It looked like a sort of advertisement, and for that reason I did not send it up to be read.

Mr. Glass' motion was then rejected.

INVITATIONS.

The Committee on Correspondence then made the following report: Letter of invitation from C. Gill, Superintendent Louisville, Cincinnati & Lexington Railroad, and L. H. Hyatt, President of Louisville and Jefferson County Agricultural Association, to visit the fair ground, was read and invitation accepted.

Mr. Lauder inquired if the Committee on Invitations were expected to report on these subjects.

Mr. Johann suggested that it be canvassed in the convention, to save time.

The Secretary here read a dispatch from the President of the Cincinnati Industrial Exposition inviting the Association to visit the same.

Mr. Setchell, Little Miami Railroad—Moved that it be received, and invitation accepted. He thought there could be no better place to get an expression of opinion than in the convention.

Mr. Hayes, Illinois Central Railroad—If we accept that invitation I suppose it becomes obligatory upon us to go. I think it better to refer it to the Committee. Let them canvass it, and save time. We may spend an hour here in discussion, when it can be done in a quiet way in a few minutes. If we pass the vote it may be only four or five members that desire to go. Of course, I feel proud of the invitation; but nevertheless my time will not permit me to go there, and I suppose it is so with many others.

Mr. Setchell—I do not so understand it. The vote of the Association does not bind any member to go, and I don't see how a reference will save time.

Mr. Lauder—I see no objection to accepting this invitation at once. This canvassing by the Committee was tried yesterday in the case of the proposed visit to the Louisville & Nashville shops, and at 4 o'clock I could not tell of a single man that was going except myself.

The motion was then adopted.

The Committee on Correspondence reported a letter from J. B. Pendleton, Second Vice-President, which was read and ordered to be placed on file.

A communication was read from J. H. Coyne, tendering to members of the Association each a copy of his Railroad Manual.

On motion, the communication was received and the books accepted.

A communication was also received from Thatcher Perkins, Superintendent Machinery Louisville & Nashville Railroad, extending an invitation to the Association to visit the Mammoth Cave by a special train on this road.

On motion, the invitation was accepted.

President—The next business in order is hearing the report of the Committee on Construction of Furnaces.

CONSTRUCTION OF FURNACES.

To the American Railway Master Mechanics' Association:

GENTLEMEN: Out of the total number of answers received to the questions asked as per circular issued, of which the undersigned were appointed a Committee, only nine contained information relative to the questions propounded. These we give you as received.

Joseph Kelly, of the Providence & Worcester road says: "Our average mileage per ton of coal is 55 miles. Soft coal used."

L. S. Young, of the Cleveland, Columbus, Cincinnati & Indianapolis road, says: "43 miles to 1 ton of coal for plain fire-box; 56 miles to 1 ton of coal for Jauriet fire-box. Evaporation, 5¾ pounds water to 1 pound coal, plain fire-box; 8 pounds water to 1 pound coal, Jauriet fire-box. Grate and tube service, 15 to 852."

F. A. Perry, of the Cheshire & Ashuelot Railroad, says: "We use the plain fire-box, sometimes with brick arch, and sometimes without. About 40 miles to the ton of coal on freight. We do not use coal on passenger engines. Have made no test on evaporation. Grate 60x36; 154 2-inch tube." The kind of coal used is not given.

The letters of Mr. Ham, of the New York Central, and Mr. Towne, of the Hannibal & St. Joseph road, we think best to inclose as they are, as we could not give a fair statement of their contents without copying almost entire; while the letters as they are we think will be more satisfactory.

We have several circulars filled out, but without proper address to show to what road they belong. They are not, however, of special importance, as they do not give anything new, nor suggest any new ideas on the points of interest under contemplation.

The experience on this road (Erie) with all coal-burning engines running from this station (Susquehanna) is in favor of the plain fire-box for bituminous coal, which is now being generally adopted. The mileage per ton of coal consumed: Passenger, average, 43 miles to 1 ton of coal; freight, average, 33 miles to 1 ton of coal. Evaporation of water per 1 pound of coal: Passenger, 6 93-100 pounds; freights, 8 12-100 pounds. Passenger trains run an average speed of 43 miles per hour; freight at a speed of 18 miles. Tubes of all engines 2 inches diameter. Relative proportion between grate and heating surface in furnaces: Passenger, 1 foot of grate to 1,000 feet of heating surface; freight, 1 foot of grate to 1,178 feet of heating surface. It may be remarked that both passenger and freight engines are used on a comparatively level rail, and are loaded down to all they can make time with, using 130 pounds of steam.

Respectfully submitted,

E. O. HILL, JAMES B. GREGG, } *Committee.*

E. O. HILL, Esq.:

DEAR SIR: Below find reply to your circular on subject of Construction of Furnaces.

In my experience I have seen no furnace equal to C. F. Jauriet's patent. We are using this furnace in nearly all our engines, with good success, obtaining a more perfect combination of gases and more economical results in the consumption of fuel than any other furnace. Size of our standard furnace, having Jauriet improvement, is 60 inches long, 35 inches wide and 62 inches high. For six months ending May, 1871, our passenger average 59 6-100 miles to 1 ton of coal; freight engines average 43 4-15 miles. This is actual miles run, no mileage being allowed for switching or making up trains. On trial of two passenger and two freight engines for four weeks we find the following results in the number of pounds of water evaporated to one pound of coal consumed:

Passenger engine No.	5	7 5-100	pounds water to 1 pound coal.			
" " "	49	6 64-100	"	"	"	"
Freight engine No.	52	6 36-100	"	"	"	"
" " "	66	6 89-100	"	"	"	"

The above trial was made during the latter part of May and fore part of June, with the advantage of pleasant weather most the time. Relative proportion between grate and tube surface in furnace of above engines about 66 to 1.

Should have reported sooner and supposed I had done so, but in some way it seems your circular was overlooked and forgotten until found among other circulars to-day. Hope it will reach you in time to be of some service in making up your statement, if indeed it should be of any value at all.

Very respectfully,
H. A. TOWNE, General Master Mechanic.

E. O. HILL, Esq., Superintendent of Motive Power, Erie Railway:

DEAR SIR—In answer to your questions on the Construction of Furnaces, please find reply.

1st. Jauriet patent.
2d. 50 miles.
3d. 4,500 pounds water to 100 miles, and two tons coal.

Standard locomotive cylinders, 16x24 inches.

Heating surface in fire box		1 0.31	square feet.
" " in tubes		862 44	" "
Total heating surface		962.75	" "
Area of fire grate		14.2	" "

Locomotive No. 24, cylinders 15x22 inches.

Heating surface in fire-box		85	square feet.
" " tubes		645	" "
Total heating surface		730	" "
Area of fire grate		11 58	" "

Locomotive No 3, cylinders 18x22 inches.

Heating surface in fire-box		116	square feet.
" " tubes		813	" "
Total heating surface		929	" "
Area of fire grate		15.75	" "
15x22 inch cylinders, heating surface		7.5 to 1 inch in favor of tube.	
18x22 " " " "	7	"	"
16x24 " " " "	8.5	"	"
15x22 " " grate surface	55.7	"	"
18x22 " " "	51.6	"	"
16x24 " " "	60.7	"	"

Yours, etc., C. T. HAM.

The President then announced a recess of ten minutes, to allow new members to sign the constitution and by-laws.

[TO BE CONTINUED.]

Narrow-Gauge Railways.

During the past year or so, dozens, if not hundreds, of articles on narrow-gauge railways have been published by the non-technical press on both sides of the Atlantic. Many of those articles are of a moderate tone and have evidently been written with a fair knowledge of the advantages which narrow-guage railways do and do not possess; but others—and these are the majority we regret to say—abound with errors which would be ridiculous if it were not that they may become mischievous by creating a false impression on the public mind. In the United States especially, the wildest possible statements regarding narrow-gauge railways have been made in many non-technical papers, and it is probably in no small degree due to this that several of the professional journals in that country are now opposing the development of the narrow-gauge system, their opposition being mainly founded on the reckless assertions of many of those by whom the system has been advocated. In other words, we believe that in their eagerness to point out the fallacy of statements made by foolish friends of the narrow-gauge system, several of our professional contemporaries in America have been led to lose sight of the substantial advantages which that system really possesses. Naturally a discussion has arisen from this opposition, and our own articles on the subject have been freely quoted on both sides, each party choosing those particular passages which it deemed corroborative of its own views. It is this circumstance which has led us to write again on a subject respecting which so much has been already written that it is almost worn threadbare; and we desire in the present article—even at the risk of employing arguments which we have already advanced—to state as clearly as we can the points wherein we believe several of our professional American contemporaries are wrong in their opposition to the construction of narrow-gauge lines.

The opponents of the narrow-gauge system found their opposition principally on three assertions; namely, first, that light lines may be constructed on the standard 4ft. 8½in. guage as cheaply or very nearly as cheaply as on one that is narrower; second, that a break of gauge is a most important evil; and third, that the alleged reduction in the proportion of dead weight to paying load which the supporters of narrow-gauge railways affirm can be effected with that system, is a visionary idea not supported by the results of practice. We shall consider these statements in the order in which we have mentioned them.

It must be well known to all who have read the articles on narrow-gauge railways which have appeared in this journal, that we have never advocated extremely narrow gauges. When the question of what gauge should be fixed upon for the secondary lines in India was under discussion, we persistently set forward the merits of the 3ft. 6in. as compared with the 2ft. 9in. gauge, and we at the time explained fully our reasons for so doing. While admitting that the first cost of a 2ft. 9in. line would be slightly less than that of a 3ft. 6in. line laid with the same weight of rails, we pointed out that with the former gauge the rails would be subjected to greater strains by the oscillation of the rolling stock, that the effect of inequalities in the road would be greater in the narrower gauge, that the accommodation obtainable in the rolling stock would be more limited, and that altogether

the saving would not compensate for the inconveniences it involved. The gauge actually chosen for the Indian lines, namely, one metre, or 3ft 3⅜in., differs so slightly from that which we advocated that it would be idle to imagine that the one possesses any great advantage or disadvantage as compared with the other. The very arguments, however, which we advanced against the adoption for India of a less gauge than 3ft. 6in. are now being used on the other side of the Atlantic, and with considerable effect, to prove that any departure from the gauge of 4ft. 8½in. is unadvisable; but it may, we think, easily be shown that they are by no means applicable to such an end. All writers on the narrow-gauge question who possess any knowledge whatever of their subject, are ready to admit that with the same weight of rails a reduction is effected in the cost of construction of a line per mile as the width of the gauge is diminished. The actual amount of this reduction and the ratio it bears to the diminution of the gauges is disputed—and it must, in fact, differ in almost every case where a line has to be made—but the fact that there *is* such a reduction is allowed. On the other hand, it is also allowed, even by the strongest partisans of the narrow gauge, that the diminution of the width of gauge is attended with some loss of accommodation, although the ratio in which the accommodation is deteriorated as the gauge becomes less is also a matter of dispute. Thirdly, it is also admitted on both sides that there is no necessity that the accommodation on second-class lines—such as cheap railways must necessarily be on whatever gauge they are constructed—should equal that afforded on the main trunk railways, the term "accommodation" being here intended to have its broadest meaning.

These facts being premised, we may now enter into greater detail. If a careful examination be made, on the one hand, of estimates for lines of different gauges (and several such estimates have been published in this journal), and on the other of designs for the rolling stock of such lines (the capabilities of such stock for running at various speeds being duly regarded), the important fact will be discovered that whereas the *rate* of reduction in the cost of construction of a line diminishes as the gauge itself is diminished, the rate of reduction in the accommodation increases with the reduction of the gauge. In other words, as a line is reduced in width below the ordinary 4ft. 8½in. gauge, the cost of construction at first diminishes in a more rapid ratio than the loss of accommodation, while subsequently these conditions are precisely reversed. It follows from this that the arguments advanced against the reduction of a gauge from 3ft. 6in. to 2ft. 9in. do not necessarily apply to a reduction from 4ft. 8½in. to 3ft. 6in., and it also follows that there is a certain point beyond which, if the gauge is reduced, the result is a loss of accommodation quite out of proportion to the saving in construction. The point at which this result is produced it is impossible to fix definitely, as its position will vary according to the nature of the country which the line has to travel, and the class of accommodation which it is desired to furnish. In fixing upon the guage for any particular district, therefore, all that can be done is to endeavor to obtain the best average results. We ourselves, taking in consideration the general features of the districts to be accommodated by narrow-gauge railways, have advocated the 3ft. 6in. guage, and our opinions in the matter are, we know, shared by Mr. Carl Pihl, the engineer of the Norwegian narrow-gauge lines, Mr. John Fowler, Sir Charles Fox and other engineers. Mr. Fairlie, on the other hand, has maintained the merits of the 3ft. gauge, and he has done so with great ability, while still narrower gauges have been advocated by Mr. C. E. Spooner, the engineer of the Festiniog Railway, and others. It is not our purpose to reopen here a discussion of the relative merits of these various gauges, and we merely mention them to remark that they are probably all situated between those limits within which the gauge of greatest economy is to be found in most cases in which the construction of narrow railways is desirable. It follows, therefore, from what we have stated, that where the maximum accommodation required is less than the *maximum* (not the ordinary accommodation) which the 4ft. 8½in. gauge can afford, a diminution of the gauge may be resorted to with economy in all but a few exceptional circumstances, such as cases in which a short narrow-gauge line would have to form a portion of a system of railways of a gauge already established. This brings us to the second assertion made by the opponents of narrow-gauge railways, an assertion which we must now proceed to consider.

In doing this we may state to commence with, that we are perfectly willing to allow that a change of gauge is an evil; but we believe it to be an evil the importance of which has in many instances been greatly exaggerated. It is an evil that the goods sent by ordinary railways have to be transferred to horse-vans for delivery at our houses; but no one would on that account advocate the abolition of such vans. Even if it were possible, it would not pay to construct lines through all the streets of our towns and cities for the delivery of our goods direct from the railway wagons; and just in the same way it will not pay for the standard lines to be extended to all parts of a thinly populated district. In the latter case light narrow-gauge lines may be profitably employed in the same way as horse-vans are in the former, and in either instance the "break of gauge" becomes sanctioned by the benefits which result from resorting to it. And here we may remark that the evils of a break of gauge are by no means entirely avoided by supplementing main lines with cheap branch lines of light construction, but of the ordinary gauge. Such lines, if really light, require a special light rolling stock of their own, and hence the trans-shipment of goods from the main line to the branches or *vice versa* is as much a necessity as if the lines were of different gauges. This is a fact which has been frequently pointed out, but is one which is still constantly ignored by the opponents of narrow-gauge railways.

Next, it must be remembered, that in the case of narrow-gauge lines being worked as extensions of main lines of the ordinary gauge, the greater proportion of the goods, of which the transport is affected by the break of gauge, are of the character best adapted for economical trans-shipment. In the case of thinly populated districts, such as narrow-guage lines are expressly intended to develop, the vast bulk of the produce to be transported to the main system consists of raw materials, such as timber, minerals or agricultural products, and it is just such materials as these that can be trans-shipped with the least expense and liability of damage. Manufactured articles passing in the opposite direction, namely, from the ordinary to the narrow-gauge, will have to be trans-shipped it is true; but their tonnage will necessarily form but a small percentage of the whole traffic. If we take the average cost of transshipment of goods, including interest on cost of plant employed, at 1½d. per ton, we shall probably be materially overrating the expense, even in districts where labor is highly paid, and yet it may be shown that even at such a rate the interest on the saving effected by substituting a narrow for the ordinary gauge, in a line of the moderate length of 50 miles, would suffice to balance the cost of trans-shipment of a larger tonnage. Let us suppose, for instance, that the saving effected by adopting a 3 ft. 6in. instead of the ordinary 4ft. 8½in. gauge, was but £200 per mile (and in many districts it would be double this), then the saving on 50 miles would be £10,000. The interest on this saving, taken at 5 per cent. only, would be £500 or 120,000 l. per annum, and taking the cost of trans-shipment at 1½d. per ton, this would suffice for transferring 80,000 tons of goods annually, or 260 tons per day for 300 days in the year, no mean amount of traffic. This fact, we think, speaks for itself.

So far we have only spoken of narrow-gauge lines as extension of railways of the ordinary gauge; but it must be borne in mind that there are numbers of districts where the narrow-gauge system would be entirely independent of lines of any other gauge, and where, consequently, the question of break of gauge would not come into consideration at all. The advantages possessed by the narrow gauge in such situations we shall point out presently when speaking of the third argument advanced by the opponents of the system.

The assertion that the proportion borne by the dead weight of the rolling stock to the net load carried cannot be reduced by reducing the gauge, is true when regarded in its broadest sense; but it is not true when its application is limited by the conditions to be fulfilled in ordinary practice. We have ourselves frequently pointed out that the adoption of a broad gauge does not necessarily involve the hauling about of an undue amount of dead weight, so long as the size of the wagons is not limited, and full loads can be obtained. In other words, it would be possible to construct a wagon for a 7ft. gauge which would have as small a dead weight in proportion to the full load carried as the best wagon which could be built for a gauge of 3ft. 6in.; but the former wagon would probably have to possess quite four times the floor area and eight times the capacity of the latter, and it would therefore be of a very unhandy size for the ordinary exigencies of traffic. The advantage of the narrow-gauge system consists, therefore, not in its enabling the wagons used on it to be built with a less proportion of dead weight than could possibly be the case with wagons built for a wider gauge; but in its enabling wagons *of a size convenient for the general requirements of the traffic to be met with in thinly populated districts* to be constructed with such a less proportion of dead weight; or, in other words, it enables smaller vehicles to be used without causing the proportion of dead weight to full paying load to be increased beyond the best results obtainable on the ordinary gauge. As in the construction of the line itself, however, there is a limit beyond which the decrease of the gauge ceases to be of any practical benefit in the way just named, the diminution which it causes in the accommodation eventually more than counterbalancing its advantages in other respects. It is this fact, which we have pointed out on previous occasions, which has always led us to oppose the adoption of extremely narrow gauges, but our arguments against such gauges by no means apply to a reduction from a width of 4ft. 8½in. to say about 3ft. 6in.

The fact of the narrow-gauge system enabling smaller vehicles to be used without increasing the proportion of dead weight to full paying load leads to practical advantages which appear to us to be underrated by the opponents of that system. Apart from the well-known fact that it is easier to insure full loads for the smaller carriages or wagons—thus keeping down the proportion of dead weight, and at the same time fulfilling the requirements of ordinary traffic—the smaller vehicles offer other advantages, and notably that of being more readily handled at stations. The actual total amount of labor expended in loading up wagons and making up a train of a given weight may not be greater if the train is composed of 10-ton wagons than it would be if the train consisted of wagons carrying but 2 tons each; but whereas in the former case several men would be employed a short number of hours, in the latter case the work could be done by a much smaller number of men employed a proportionately longer time. In the case of stations contributing but a moderate amount of traffic this is a great convenience, as it enables a small staff to be kept continuously employed, instead of necessitating the maintenance of a large staff whose time would be but partially occupied. In the case of slight accidents, also, such as derailment, the moderate size and weight of the narrow-gauge stock greatly tends to prevent expensive and vexatious delays.

The length to which this article has already extended warns us that we must leave for future notice some features of the system under consideration, but we cannot conclude without referring briefly to the connection between narrow-gauge railways and the Fairlie engine. This is a point concerning which much misunderstanding appears to exist on the part of certain of our American contemporaries, and it appears to us to be desirable to point out wherein this misunderstanding consists. It has been urged, for instance, by the Chicago RAILROAD GAZETTE, that on the one hand, if the narrow-gauge system is good for thinly populated districts, its advantages should be available whether Fairlie engines are used on it or not; and that, on the other hand, if the Fairlie system is good, its advantages should be as apparent on the ordinary gauge as on narrower lines. The fallaciousness of such arguments will, we think, be apparent if the questions at issue are more closely considered. It is a well-known fact that a given weight of goods can be transported more economically in a few heavy trains than in a greater number of trains of lighter weight, so long as the adoption of the former system does not entail the employment of locomotives of a class destructive to the line. The greater the weight of a train the less is the proportional cost of the wages of the men in charge, while the heavier the trains also the greater is the tonnage which any given line will be capable of transporting within a given number of working hours, and the less occasion is there for double shifts of signal-men, etc., to accommodate night traffic. We thus see that to obtain the full benefits of a narrow-gauge line, the trains worked on it, although composed of units of small weight, should consist of such a number of those units that the weight in the aggregate is fully equal to that of heavy trains on the ordinary gauge. But so long as the ordinary type of locomotive is adhered to, it is impossible to construct engines capable of hauling such trains on the narrow-gauge lines without resorting to an excessive weight per wheel, and it is here that the Fairlie system steps in and solves the difficulty. The Fairlie system, in fact, enables very powerful locomotives to be placed on a line which would otherwise accommodate engines possessing but very moderate hauling power, and it in this way very vastly increases the capabilities of a narrow-gauge line, and enables it to accommodate an amount of traffic which could otherwise only be carried on on a wider gauge. It is in this way that narrow-gauge railways and the Fairlie system are so intimately connected, and there is, as we have recently pointed out, ample evidence that as the construction of narrow-gauge lines is extended in districts where a heavy traffic has to be accommodated, this connection will necessarily become still more intimate. The prejudice with which the Fairlie system was at one time regarded in the United States (as, indeed, it was elsewhere) is, we are glad to find, rapidly wearing away as a knowledge of the features which distinguish it become better known. It is still, however, by no means uncommon to find in the pages of American technical journals evidence of the misconception with which Mr. Fairlie's plans are still regarded in some quarters. Thus we were much amused a few weeks since at finding in the Chicago RAILROAD GAZETTE a letter from a gentleman who evidently prided himself greatly upon his practical knowledge of locomotives and their management, who yet announced, as if it were a brilliant discovery, that a Fairlie engine with two six-wheeled steam bogies had more working parts than an ordinary four-coupled engine of less than half the power, and without its tender! The same individual also displayed his intimate acquaintance with the extent to which tank engines are now in use, by announcing that the plan of carrying the fuel and water on the engine was impracticable on account of its being impossible to arrange the springs so as to suit the variations of load! The letter was, in fact, so ridiculous that we should not have noticed it had it not been for the prominent position assigned to it in the important journal in which it appeared. It is of course of no use replying to the assertions of men of the class just referred to; they must be left to inform themselves of the real facts of the subject on which they write, and when they have done so, they will cease to require answering.—*Engineering.*

TRAFFIC AND EARNINGS.

—The traffic receipts of the Great Western of Canada for the week ending October 20 amounted to £21,725, against £18,200 in the corresponding week of last year, showing an increase of £3,535, or 19 1-3 per cent.

—The Omaha *Herald* is authorized by the General Superintendent of the Union Pacific Railroad to state that, through the joint action of the Central Pacific and Union Pacific Companies, freights on ores of a valuation less than $100 per ton, between Ogden and San Francisco and Ogden and Omaha, will be reduced $47.50 per car load, or to $14 per ton, against $18.75 per ton heretofore. The new rate went into effect on the 15th of the present month.

—The freight and passenger business on the West Wisconsin Railroad has nearly doubled during the past six months.

—The receipts of the Grand Trunk Railway of Canada were:

For week ending October 14, 1871	£38,600
For week ending October 14, 1870	34,000
Increase (13 2-3 per cent.)	£4,600
For week ending October 21, 1871	£39,400
For week ending October 21, 1870	30,700
Increase (28 1-3 per cent.)	£8,700

—The following interesting statement concerning the grain trade of Duluth is made by the Duluth *Tribune* of the 11th inst.:

"The wheat and flour is accumulating so fast here, and the period of through navigation is necessarily so short, that it has become evident the regular boats cannot take it all away to the East before the closing of the Sault Canal at the time set for its closing, viz.: the 1st of December. Capt. Atkins, the agent of the Union Steamboat line, has therefore, we understand, telegraphed for three of their great grain steamers to come immediately to this port—viz.: the Jay Gould, B. W. Blanchard and Wm. M. Tweed. * * * We would remark that the railroad authorities have been for some time past refusing to take flour—that is, to guarantee its transportation East—at the rate of 1,000 barrels a day; and that from 200,000 to 250,000 bushels of grain would have been forwarded to this port, if there had been vessels enough to take it off. Superintendent Hungerford estimates that the grain and flour seeking the Eastern markets *via* Duluth and the lakes *next year*, will show an increase of 400 per cent. over this year. The eastern bound freight over the Lake Superior & Mississippi River Railroad has exceeded an average of 750 tons a day since harvest."

RAILROAD GAZETTE

Published Every Saturday.

A. N. KELLOGG, *Proprietor.*

S. WRIGHT DUNNING AND M. N. FORNEY, *Editors.*

W. H. BOARDMAN, *Acting Publisher.*

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Editorial Announcements.

Address.—The RAILROAD GAZETTE *will be printed for the present in New York; our printing house in Chicago having been destroyed. All communications, therefore, whether editorial or business, should be directed to the New York office. The proprietor will receive subscriptions and advertisements at his office in Chicago, Nos. 63 and 65 South Canal street, but letters should be addressed to New York.*

Correspondence.—We cordially invite the co-operation of the railroad public in affording us the material for a thorough and worthy railroad paper. Railroad news, annual reports, notices of appointments, resignations, etc., and information concerning improvements will be gratefully received. We make it our business to inform the public concerning the progress of new lines, and are always glad to receive news of them.

Articles.—We desire articles relating to railroads, and, if acceptable, will pay liberally for them. Articles concerning railroad management, engineering, rolling stock and machinery, by men practically acquainted with these subjects, are especially desired.

Inventions.—No charge is made for publishing descriptions of what we consider important and interesting improvements in railroad machinery, rolling stock, etc.; but when engravings are necessary the inventor must supply them.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

"ENGINEERING" AND NARROW GAUGE.

On another page we reprint an editorial entitled "Narrow-gauge Railways," in which our transatlantic contemporary, *Engineering*, reviews some of the arguments against the new system of railroads in a spirit which is so fair that it is a pleasure to read the article and an agreeable task to reply to it, which we propose doing in as few words as possible.

This article says that if the saving effected by adopting a 3ft. 6in. instead of a 4ft. 8½in. gauge be £200, that on a line of 50 miles long the saving would be £10,000, and that the interest on this sum at 5 per cent. would be £500, which is all certainly true; but we cannot admit £200 per mile; but think that in any ordinary country the difference would hardly exceed £100, or $500, which for a line of 50 miles long would amount to $25,000, the interest on which at 7 per cent. would be $1,750 per annum. In reply to which we will quote a sentence from an editorial article on this same subject published in the GAZETTE of August 26: "It is, then, a question for those who are now contemplating the construction of narrow-gauge roads whether this slight difference will be sufficient compensation for the inconveniences which must attend a break of gauge, and which, it must be remembered, are not lessened in the least by any difference in the cost of the two gauges."

In reply to the remark "that the evils of a break of gauge are by no means entirely avoided by supplementing main lines with cheap branch lines of light construction, but of the ordinary gauge," it may be said that while it is perhaps impracticable to run heavy cars on a light road, there is no difficulty in running light cars on a heavy road. While a mixed traffic made up of light and heavy cars might not be desirable, trains of light cars could be made up and run on the road intended for heavy traffic. In fact, in Canada we have an example of almost exactly this kind. The Toronto, Grey & Bruce, a three-feet six-inch gauge road, is now running its trains over about eight miles of the Grand Trunk line, having added a third rail to the latter for that distance. It is quite impossible to see why light cars, if they were of the right gauge, might not just as well run on two rails of the wide-gauge road as they now do on one.

With reference to the weight of rolling stock the writer in *Engineering* says "the advantage of the narrow gauge consists in its enabling wagons *of a size convenient for the general requirements of the traffic to be met with in thinly populated districts* to be constructed with such a less proportion of dead weight." In other words, it is said that the dead weight of *small* cars will be much less on a narrow-gauge road than on one with the rails farther apart, a position which, as has been frequently shown in the RAILROAD GAZETTE, is quite untenable. The weight of a car body is neither increased nor diminished by the length of the axles, and if it is desirable to have its capacity small, it is difficult to see how the distance apart of the rails will affect its weight. This is especially true of American cars with double trucks or bogies. The body of any car which has ever been run on a 3ft. 6in. gauge road could be transferred to 4ft. 8½in. trucks, and it is inconceivable how the weight or capacity of the former would be influenced by such a transfer. The only difference in the weight of the car would be that due to the greater length and size of axles and truck frames, which is so slight that it is hardly worth consideration. If what *Engineering* says about the weight of cars in relation to their size be true, then it is inconceivable why all horse or "tram" roads, where every pound of weight is a consideration, have not been made of a narrower gauge. This would be especially applicable to roads on which one-horse cars are used.

We have evidence, too, from the other side of the water, that the position taken by *Engineering* has been disproved by actual experience. On another page we reprint an account of some light rolling-stock built at Bristol after the designs of Mr. Fairlie. The weight and carrying capacity of the wagons are given as follows:

Gauge.	Weight of wagon.	Capacity.	Proportion of dead to paying load.
4 ft. 8½ in.	5,040 lbs.	15,680 lbs.	1 to 3.1.
3 ft. 6 in.	4,704 lbs.	15,680 lbs.	1 to 3.3.
2 ft. 6 in.	3,472 lbs.	11,200 lbs.	1 to 3.2.

It will be seen that the difference in the proportion of dead to paying load for the different gauges is so slight as to refute the position assumed by *Engineering*.

It is, perhaps, not surprising, after seeing that the writer had fallen into such an error, to find him basing his refutation of what we have said about the advantages of the Fairlie engine on this assumed fact. Will he tell us why, if such engines are good to draw heavy trains composed of "units" of small weight on a narrow-gauge road, it has not equal advantages for drawing heavy trains composed of an equal number of "units" of equal weight on a 4ft. 8½in. gauge. What we wish to point out is, that the advantages of the Fairlie engine—whatever they may be—are just as applicable to a wide light road, as to one which is narrow, and that the advantages of the latter, if it has any, must be entirely independent of this plan of engine. *Engineering* says: "It is impossible to construct engines of the ordinary type capable of hauling heavy trains without resorting to an excessive weight per wheel"—which may be true. But if the Fairlie system here steps in and solves the difficulty, it is hard to see why the solution is not equally applicable to both wide and narrow-gauge lines. If the Fairlie engine will haul heavy trains on light roads, why will it not do the same as well on a light wide gauge as on a light narrow gauge? If it will do equally well on either—and Mr. Fairlie says it will—then the advantages which the narrow gauge possesses are independent of this system.

An Opinion on American Railroad Management.

In the discussion at the late meeting of the Great Western Railroad Company, of Canada, held in London last month, Mr. Homan, the Vice President, said, as reported by an English paper, "He had no doubt at all that the science of railway management was much better understood in America than in England. They must be prepared for the war by land and water which was going on in America. The great products of the West must pass either by land or water to the East, and the question as to who would have it must be decided by competition and the economy in the cost of carriage. He believed that the continuous railway would be found more economical for the transit of freight from the West to the East than the water, because of the trans-shipment. There were 3,000 cars on their track painted blue, and they were to be seen at various places on the long route. A train of 30 cars could be loaded with grain in two hours."

The peculiarities which we claim as advantages in American railroad management are due in great part to the situation of the country. We have to carry freight and passengers enormous distances, which are entirely unknown, and of course impossible, on the British Islands, and this makes a difference in management necessary.

A Grand Missouri Consolidation.

The St. Louis papers have given currency to a report that an agreement has been made for the consolidation of all the Missouri railroads entering that city except the St. Louis & Iron Mountain, embracing the North Missouri, Pacific of Missouri, Atlantic & Pacific and the Missouri, Kansas & Texas. The Pacific of Missouri and the Atlantic & Pacific have had a common general management for several months; but there has been very little harmony and severe competition between that management and the Missouri, Kansas & Texas, and also, to some extent, with the North Missouri. We have heard of no facts to justify the report of this consolidation, but for some time past steps have been taken which rendered probable a harmonious management (not a consolidation) of the Missouri, Kansas & Texas, the North Missouri and the Chicago & Alton with its leased line, the new Louisiana & Missouri River road. By this arrangement, it seemed probable that the North Missouri would be made to serve as a common route to St. Louis for the Missouri, Kansas & Texas and the Louisiana & Missouri River, while the Chicago & Alton would receive all traffic destined for Chicago from all the other roads, which in this way could be worked very well together and be provided with very good and direct connections with both the chief markets of the West. The recent contract of the Missouri, Kansas & Texas for the extension of its line from Sedalia northwest to connect with the Louisiana & Missouri River and North Missouri would indicate that it is not yet prepared to give all its through traffic to the Missouri Pacific, which would form its natural outlet were all the lines consolidated.

The lines named as likely to be consolidated include nearly 1,700 miles of railroad within the limits of Missouri, which is about three-fourths of the entire mileage of the State.

Transportation Eloquence.

For some years past no Fourth-of-July oration, or other speech intended to be magniloquent, if not eloquent, has been complete without some apostrophe to the "iron horse," "net-works of iron," etc., etc. At a recent meeting in Memphis, intended to present the importance of a railroad from that place southwest to Shreveport, a vast amount of matter of this kind was let loose, and one gentleman was so very ready in the use of trains as aids to oratorical fire-works, that we copy a paragraph from his speech, which we find reported in the Memphis *Avalanche*:

"The day is not far distant when the locomotive train will start off from Hindoostan, and rushing up by the Arabian gulf through Persia and Syria, burst through the gates of Suez, thence along the southern coast of Mediterranean leap or plunge under the Straits of Gibraltar; thence up through the Pyrences into France, there meeting with another train that comes thundering down the steppes of Asiatic and Russian Siberia, through Germany, meets a third, which emerges from the snow-capped peaks of Mont Cenis, fresh from Italy, and a fourth just emerging from the earth underneath the British Channel, from Dover to Calais, and all rushing together to Point St. Nazare, then bound across the Atlantic, and landing at New York, Norfolk, Charleston or Brunswick, sets out again on its path up the Allegheny slopes, and down to this valley, where it meets with a train laden with the spices and silks of Japan, China and the Corea Islands, landed at Mazatlan or San Diego, and come thundering up this way, through Presidio, Del Rio Grande, Austin, San Antonio, Jefferson and Shreveport to the city of Memphis."

Four railroad trains bounding across the Atlantic from Point St. Nazare, or elsewhere, would make a very pretty sight, and when the leap is made may we be there to see. It is hardly fair, however, to leave the "spices and silks of Japan, China and the Corea Islands" to be vulgarly "landed at Mazatlan or San Diego," while the trains from Europe find no difficulty in "bounding" across the Atlantic. But we must confess that the Pacific *is* wider than the Atlantic.

English Railroad Companies' Gifts to Chicago.

The Great Western, of Canada, and the Grand Trunk subscribed £1,000 each for the relief of Chicago immediately after the fire. These subscriptions were made by officers who had no authority to do so, and as the Grand Trunk stockholders receive nothing from their property, it was thought that objection might be made in that company at least. But at the recent semi-annual meeting of the shareholders of these companies, this action of their

officers was approved in both cases by *unanimous* votes. The Illinois Central, whose business was materially affected and injured by the fire for a time, and which had its valuable station buildings burned, so that it was among the larger sufferers by the fire, subscribed $10,000. This company's shares being chiefly owned in England, its charity may properly be credited as an English charity.

To Members of the Master Mechanics' Association.

Mr. S. J Hayes, Treasurer of the Association, whose address is Box 933, Chicago, has issued the following circular to members whose dues he has not received:

DEAR SIR: Prior to the great conflagration in this city I notified you to forward the sum of ten dollars ($10) for dues for the fiscal year ending with the fourth annual convention of this Association, held at Louisville, Ky., on the 12th, 13th and 14th days of September, 1871.

Thinking that the money, if sent, may have been burned in the post-office, I take this means of informing you that it was not received by me. If it was sent in the form of a post-office order, you can procure a duplicate by applying to the office in your city.

Please write me about the matter, at your earliest convenience, as the Association needs funds to pay for printing the annual report, a copy of which will be sent you by the Secretary.

Delinquents will see the propriety of "walking up to the captain's office to settle"—or sending up, which will do quite as well.

Railroad Earnings for October and for Ten Months of 1871.

We copy from the *Commercial and Financial Chronicle* its tables of earnings for October and the first ten months of the year, correcting its error in giving the Chicago & Alton an increase of $16,031 in October, 1871, instead of a decrease; and also errors in the amounts reported for the Lake Shore & Michigan Southern for the ten months:

	1871.	1870.	Increase.	Decr'se.
Chicago & Alton	$459,577	$475,608	$.....	$16,031
Central Pacific	1,005,475	828,447	177,028	.....
Cleveland, Col., Cin. & Indianapolis	338,724	339,230	.....	506
Illinois Central	761,964	903,225	.....	141,261
Kansas Pacific	392,500	355,899	36,601	.....
Lake Shore & Michigan Southern	1,395,000	1,288,000	107,000	.....
Marietta & Cincinnati	175,438	153,531	21,907	.....
Michigan Central	582,802	511,477	71,325	.....
Milwaukee & St. Paul	841,150	908,313	.....	67,163
Pacific of Missouri	369,887	339,091	30,796	.....
St. Louis & Iron Mountain	175,792	127,069	48,723	.....
Toledo, Wabash & Western	600,205	451.293	148,912	.....
Union Pacific*	800,000	719,623	80,377	.....
St. Louis, Alton & Terre Haute	186,489	163,284	23,205	.....
Total	$8,101,034	$7,548,059	$745,874	$224,961
Net increase, 1871			520,913	

*Approximate.

EARNINGS FROM JANUARY 1 TO NOVEMBER 1.

	1871.	1870.	Increase.	Decr'se.
Chicago & Alton	$4,429,122	$4,025,849	$403.273	$.....
Central Pacific	7,958,827	6,633,911	1,324,916	.....
Cleveland, Col., Cin. & Indianopolis	3.106,946	2,684,471	422,575	.....
Illinois Central	7,031,865	7,174,494	.....	142,629
Lake Shore & Michigan Southern	12 120.931	10,983,963	1,136,968	.....
Marietta & Cincinnati	1,348,327	1,133,470	214 857	.....
Michigan Central	4,845,118	3,945.335	869,783	.....
Milwaukee & St. Paul	5.572,741	6,100,2?8	.....	527,514
Pacific of Missouri	2.976.306	2.904,091	72.215	.....
St. Louis & Iron Mountain	1,321,729	1,104,829	216,900	.....
St. Louis, Alton & Terre Haute	1 580,326	1.531,037	49.289	.....
Toledo, Wabash & Western	4,689,248	3,603.351	1,085.897	.....
Union Pacific	6,235,815	6,553,272	.....	317,475
Total	$63,217,334	$58,378,361	$5,719,310	$987,600
Net increase, 1871			4,838,973	

In its comments on the latter table the *Chronicle* says:

"We observe, however, that in the annual reports of different companies, South and West, which come under our notice, the complaint of competition for business in consequence of the opening of new roads, is becoming more and more frequent, and it is a question of some importance in the case of many roads, whether the increase of traffic from growth of business in the country is going to be sufficient to compensate for the losses occasioned by the competition of new roads. In regard to this point it is proper to remark upon the importance of local traffic, as those roads which have a large proportion of this kind of business cannot so easily be injured by the competition of new lines."

We fear that this complaint, in the case of many roads, will become louder and more frequent within a year or two, unless some score or two of new railroads in districts heretofore fully supplied fail utterly to get traffic.

—Russia commenced and finished a railroad 400 miles long within a single year. It completes a direct line between Warsaw and Moscow.

—Schœnberger & Bryant, of Duluth, have a contract for supplying 200 box cars to the Northern Pacific Railroad. Car-building is a new industry for Duluth.

—At a meeting of the City Council of Boston lately, one of its members, Mr. Adams Ayer, well known among railroad men as President of the Hinkley & Williams Locomotive Works, introduced an order, which was adopted, authorizing the trustees of the Boston Public Library to present to the library of the Chicago Historical Society such duplicate books and pamphlets as can be spared, which it is believed will be more than a thousand volumes. This will make a fine start for this society, whose valuable library was entirely destroyed by the fire.

Chicago Railroad News.

Illinois Central.

The Illinois Central Railroad Company are rebuilding their freight houses in Chicago, on the old ground, as rapidly as possible. They are rebuilding them upon the old walls and the old foundation; and will have them ready for use by the middle of December.

The company find themselves obliged to rebuild about half their walls.

A passenger house has been fitted up temporarily on the old ground, although the passengers are landed mostly at Twenty-second street. In about a week the passenger trains will run to the river as usual.

The company have built a temporary freight house 300 feet long a little east and south of the old house, and they are now able to receive and handle freight as rapidly, and with as much convenience to the public as ever.

A fine locomotive house has been commenced near the shops at Sixteenth street. It will have a stone foundation, with a brick superstructure, and will be covered by a slate and iron roof, ornamented with iron turrets. It will be in all respects a first-class house, and will have stalls for 15 engines.

The company are also building a frame engine house large enough for six locomotives at Forreston, where the Chicago & Iowa forms a junction with it.

Very few men have left the city on the Illinois Central Railroad this winter to find work in the South. A few days immediately after the fire a good many went away in the general panic, fearing they should have nothing to do in the city, but it was soon found that all the able-bodied men would do better to stay here than to go away, and for the last month very few have gone South.

Pittsburgh, Cincinnati & St. Louis.

The general offices of the Pittsburgh, Cincinnati & St. Louis Railway Company are, for the present, at the Michigan Avenue Hotel, on the corner of Congress street and Michigan avenue.

Chicago, Burlington & Quincy.

The Chicago, Burlington & Quincy Railroad Company have a large force at work on the section of road between Prophetstown and Clinton, Iowa, a distance of 19 miles. This portion of the road is expected to be finished and ready for opening on the first of January.

A large round-house has been commenced at Aurora, which will be 270 feet in outside diameter. It will be large enough to cover about 40 locomotives. It is under the direction of George Smith, Assistant Engineer, who is now busily engaged in planning and laying out the work.

This company has just finished a magnificent new brick foundry at Aurora, the dimensions of which are 184 feet in length by 62 feet in width, with a wing 98 feet long by 62 feet wide. In addition to the main buildings there are adjoining them new buildings for a carpenter's shop, engine house and a coal room. The main buildings are covered with a slate roof.

Michigan Central.

A large amount of freight has arrived in the city by the eastern roads since the commencement of November, and, as the merchants have not been able to take care of it as rapidly as it came, the railroad companies have all been obliged to store it away as well as they could. The Michigan Central company have been obliged to keep hundreds of cars filled with freight, and, in some cases, to store the goods away under tarpaulins until they could get their freight houses restored again; 600 cars have been lying outside filled with goods. The company have had a large number of men employed in repairing and rebuilding the old freight houses, and they are now able to receive and deliver freight, in good order and with dispatch, and with convenience to the public. The freight houses are now all repaired and as good as new.

Chicago, Rock Island & Pacific.

The Chicago, Rock Island & Pacific Railroad Company are fitting up the new southwestern line as rapidly as possible with machine shops, engine houses, etc. They are building a brick engine house at Trenton, and another at Ashland.

The company find this branch promises to be a profitable auxiliary to their main line, although the actual figures in regard to its working are not yet attainable.

Chicago & Alton.

The Chicago & Alton Company are constructing a large depot for freight at the corner of Charles and Van Buren streets. The company are also building a four-story brick structure on the corner of Van Buren and Charles streets, 60 feet long by 50 feet in width, which will be occupied as a general office. It will be completed in March next. The building will contain 950 square feet of floor surface devoted to fire-proof vaults. This company are determined that their records shall not suffer destruction, should the West Division be subject to a great conflagration.

As showing the fact that the great fire has not injured the business of this road, the following figures are subjoined. They will show that there is something going on in Chicago other than idly mourning over lost treasures. It will be seen that for the month of October there was a decided falling off, as was to have been expected; but for the week ending November 15 more than half of the decrease for the previous month was made good again.

Time.	Total Earnings.	Corresponding period for last year.	Increase in 1871.	Decrease in 1871.
Oct. 1 to Oct 31	$459,576 89	$475,608 20	.....	$16,031 31
Nov. 1 to Nov. 7	110,421 45	110,299 32	$122 13	.....
Nov. 8 to Nov. 15	118,161 45	110,299 32	7,862 13	.....

Pittsburgh, Fort Wayne & Chicago.

The general offices of the Pittsburgh, Fort Wayne & Chicago Railway Company are now established at No. 43 West Madison street.

Chicago & Iowa.

The Chicago & Iowa road is to be finished by the 25th inst., between Oregon and Forreston, so as to connect with the Illinois Central road at that point. The track will be finished on Saturday, and trains will run probably next week.

Chicago & Northwestern.

The Chicago & Northwestern Company opened their road from Menomonee to Oconto, a distance of 30 miles, on Monday of this week, the 20th inst. Trains now run through to Oconto.

The officers of this company report that the earnings of the road for November have been equal to its monthly earnings before the fire.

The Pullman Palace Car Company have fine rooms in the block occupied by the Illinois Central and the Chicago, Burlington & Quincy railroad companies. They have fitted up fine rooms, and are now ready for business as usual.

Civil Engineers' Club of the Northwest.

The Civil Engineers' Club of the Northwest held its November meeting on last Monday evening in the Sherman House, in Chicago. Little business was done except to make arrangements for the December meeting. In December it is expected that Mr. Forney will read a paper before the club.

Railroad Traffic to and from Chicago.

Since the commencement of November the railroad companies entering this city report that their freight business has largely increased. In many cases it has gone directly ahead of anything known before. The actual figures are not generally attainable yet, but it is safe to say that Chicago merchants, though obliged to do business to a large extent in sheds and shanties this winter, find that their business is to be large; they find, indeed, that the Northwest is still bound to buy its goods in Chicago, and the result has been that the lines of railroads leading east from this city have been put to the extent of their resources, in some instances, to transport the goods ordered by Chicago merchants. For it must be remembered that the entire stock of goods, almost, had to be renewed. The house of Field, Leiter & Co., it is said, is doing a much larger business than before the fire, and almost everybody else who has become re-established in business, reports that business was never better. Building materials are very much needed, and all the lines of railroad have a heavily increased business in the transportation of brick especially—for it seems the future Chicago is to be built of brick.

The live-stock business flourishes here as usual. The Chicago & Alton Railroad Company report a largely increased business in the transportation of stock.

Location of New Depots.

A great deal is being said in this city, at present, about the rebuilding of the great railroad depots. The officers of the Michigan Southern and Rock Island & Pacific roads have decided to rebuild conjointly on their old foundation, fronting on Van Buren street. They will not commence operations, however, until next spring.

The question as to whether the city will sell the blocks on Michigan avenue for a site for a union depot for the Illinois Central, Chicago, Burlington & Quincy and Michigan Central Railroad companies is still in abeyance—still in the courts; although it is understood that the great majority of the aristocratic residents on Michigan avenue who were opposed to the depot before the fire have bowed to the logic of events, and withdrawn their opposition. It is now apparent that there are to be no more residences built in the burnt district of the South Division, and that Wabash and Michigan avenues must become business streets ultimately as far south as Twenty-second street. In fact, Wabash avenue has already become a business street to that point, and much of the business will remain, no doubt. Lake park is now covered from end to end with wooden structures used as wholesale houses. The idea that the park can ever be used for ornamental purposes finds no lodgment in the most active imagination, and further opposition to the railroad companies is regarded by nearly all business men, as not only foolish but suicidal, so far as property values are concerned along the lake front. A card was published in the *Tribune* Sunday, signed by five of the leading real estate brokers of this city, giving it as their opinion that real estate values would be enhanced from 25 to 50 per cent. in the vicinity of the proposed depot, if the opposition to its construction should be withdrawn so that the companies could go on and construct it.

It is reported that the Chicago, Burlington & Quincy company, in connection with the Baltimore & Ohio company, will put up a fine depot in the West Division, abandoning the idea of building on the lake shore, if the opposition to the project on the part of citizens is not withdrawn.

The Chicago & Northwestern, the Chicago & Alton and the Pittsburgh, Fort Wayne & Chicago companies will probably build a great union depot in the West Division next season. The officers are discussing the subject, and, although nothing definite has yet been done about it, it is pretty sure to be accomplished before a great while.

Salisbury & Baltimore.

The Cumberland *News* learns from parties on the line of the Salisbury Branch of the Baltimore, Connellsville & Pittsburgh Railroad, now in course of construction from Myer's Mills to Salisbury, in Somerset County, Pa., that the work is progressing toward completion quite rapidly. All the grading and masonry, it is expected, will be completed this month, and by the holidays it is hoped the track will reach Salisbury. Several mining companies have commenced operations on the line of the new road, and three large openings have been made for the shipment of coals as soon as the road is ready for traffic. The road passes through a very valuable coal district.

General Railroad News.

ELECTIONS AND APPOINTMENTS.

—The following is a list of the incorporators and of the officers of the Laclede contractors who have taken the contract for the construction of the Laclede & Fort Scott and the Missouri Central (late St. Louis & Fort Scott) railroads:

Chicago—G. A. Fitch, C. W. Colehour, O. L. Grant; New York—J. R. Shipherd, W. F. Herbert, E. D. Butler, E. H. Dewey; Missouri—J. E. Kaime, St. Louis; W. J. Budd, Union, Franklin county; Germany—W. W. Murphey and G. O. Glavis, Frankfort-on-the-Main. The officers are: President, O. L. Grant; Vice President, G. O. Glavis; Secretary, E. H. Dewey; Superintendent of Construction, W. J. Budd; Auditor, G. A. Fitch; Treasurer, E. D. Butler; Financial Agent, J. R. Shipherd.

—At the annual election for directors of the Pacific Mail Steamship Company in New York, on the 16th inst., the following were chosen: A. B. Stockwell, James D. Smith, H. H. Baxter, O. P. C. Billings, C. J. Osborn, A. Masterton, E. C. Taylor, Le Grand Lockwood, Henry Clews, each of whom received 118,696 votes; and at a meeting of the board held Thursday, Mr. Alden B. Stockwell was unanimously elected President, and Mr. Francis W. G. Bellows, Vice President.

This is a radical change, and, it is said, will result in important changes in the management of the company, which, since the completion of the railroad to the Pacific, has not flourished.

—The following is a corrected list of the directors of the Indianapolis, Cincinnati & Lafayette Railroad Company elected at the meeting in Indianapolis, November 6: George H. Chapman, Indianapolis; Augustus S. Winslow, Samuel J. Broadwell, Joshua H. Bates, Joseph C. Butler, Cincinnati; William A. Booth, George Bliss, John S. Kennedy, New York; Thomas H. Perkins, Boston. The following officers were elected: President, William A. Booth, New York; Vice-President, A. S. Winslow, Cincinnati; Secretary, Charles S. Booth, New York.

—The directors' meeting for the Western Division of the Western North Carolina Railroad will meet at Asheville on Monday, the 10th of December. The following gentlemen have been appointed by the Governor directors for this division of the road: W. W. Rollins, N. W. Woodfin, A. L. Herren, R. M. Henry, J. W. Sorrell, C. W. Slagle, G. W. Dickey and W. G. Candler. State's Proxy—W. G. B. Garrett.

—The stockholders of the Savannah, Griffin & North Alabama Railroad have elected A. J. White President, and W. A. Huff, of Macon, and Messrs. Boynton, Chapman and Stewart, of Griffin; Whitaker, of Fayette; Wilkinson and Smith, of Newnan, and Camp and Long, of Carrolton, directors.

—Arthur W. Soper has been appointed General Superintendent of the Iron Mountain road, vice Addison Day, resigned.

—Harry Converse has been appointed Division Manager of Telegraphs of the Pittsburgh & Columbus Division of the Pittsburgh, Cincinnati & St. Louis Railway.

—The following are the directors of the St. Louis & Keokuk Railroad Company: Henry C. Wellman, President; C. F. Kirtley, Vice President; Walter McFarland, William M. Ely, of Rolla County, Mo.; A. McPike, Barton Able, St. Louis; M. S. Goodman, John O. Roberts, William McIntosh, Clarksville, Mo.; W. C. Orr, William Stark, Louisiana, Mo.; A. G. Griffith, Thomas Bowling, Hannibal, Mo. James F. Cook is Chief Engineer.

—The following is a complete list of the officers and directors of the Cairo & Fulton Railroad Company: Thomas Allen, St. Louis, President; H. G. Marquand, New York, Vice-President, D. W. McWilliams, Treasurer; Wm. R. Donaldson, Secretary; Jas. M. Loughborough, Land Commissioner; James A. Morley, Chief Engineer. The two latter officers will have their quarters at Little Rock.

The directors are: Thomas Allen, H. G. Marquand, W. R. Allen, Elon G. Smith, Sylvester H. Laflin and L. B. Clark; also John H. Swift, W. H. Swift, Alanson Trask, W. T. Blodgett and Henry M. Alexander, of New York.

The offices of the company will be hereafter with the St. Louis & Iron Mountain Company, corner of Fifth and Market streets, St. Louis.

—The directors of the Kennebec & Wiscasset Railroad Company—a new Maine corporation—are: Henry Ingalls, Richard H. Tucker, Andrew Lacy, Isaac T. Hobson, Alfred Lenox, Isaac H. Coffin, all of Wiscasset; General Wm. M. Tilton, of the National Military Asylum at Chelsea (Togus); Thomas N. Ayer, of Alna, and Sanford K. Partridge, of Whitefield. Henry Ingalls is President.

—P. Bridgman has been elected President of the Boston, Nashua & Acton Railroad Company.

—George Noble, late Assistant Superintendent of the Kansas Pacific, has accepted an appointment as General Superintendent of the Kansas Central.

—The Memphis *Avalanche* of the 13th inst. says: "At an election of Mississippi & Tennessee Railroad directors held here yesterday the following gentlemen were elected to serve during the ensuing year: F. M. White, A. T. Lacey, A. N. McKee, J. C. N. Robertson, A. M. West, W. A. Rayburn, R. P. Neely, N. R. Stedge and N. Howard. The following-named gentlemen retire from the directory: R. D. McLean, J. W. Caldwell, W. K. Love and E. F. McGee. It is understood that a sufficient number of the new directors are in favor of the McComb interest to control the affairs of the road, also that by an agreement the present officers will continue to manage affairs for another year."

—At the annual meeting of the Baltimore & Ohio Railroad Company, November 21, the old Board of Directors was re-elected, the only change being the election of John King, Jr., to fill the place of the late Albert Schumaker. The composition of the board at present is as follows: Johns Hopkins, Samuel W. Smith, Francis Burns, John Spear Nicholas, John Gregg, C. Oliver O'Donnell, James Harvey, Galloway Cheston, William W. Taylor, Samuel Kirby, Allen A. Chapman, J. R. Blake, W. T. Browning, A. P. Burt, William H. Cole, G. R. Dennis, D. J. Foley, J. A. Henderson, D. P. Hoffman, William Kimmell, J. G. Medinger, D. Mordecai, P. P. Pendleton, J. A. Ritter, E. K. Wilson and John King, Jr. John W. Garrett is President; John King, Jr., First Vice President; William Keyser, Second Vice President.

OLD AND NEW ROADS.

Canada Southern.

Mr. Finney, the Chief Engineer of this road, writes to us under date of November 13 as follows:

"We have about 200 miles of our road graded, the bridging on our main line nearly completed and that on our St. Clair Division well under way. The entire grading and bridging, ready for the track, will be completed early next spring. We have just received two locomotives, from the Baldwin Works, in Philadelphia, to be used in the track-laying. They are of our standard freight pattern, cylinders 16x24, 5ft. drivers, weighing 20 tons. Our main line is to be laid with the best English steel rails, 60 pounds to the yard, with fish joint and chair. Mr. Albert Congdon, formerly Master Mechanic of the Lake Shore & Michigan Southern Railway, has received the appointment of Master Mechanic on this road, and enters upon his duties at once in the arranging for the shops and machinery for the road. As soon as navigation opens on the lakes next spring our steel rails will be delivered, and, with favorable weather, we shall hope to have our road open for business during the coming year. Our western connections—the Canada Southern & Chicago Railway, from Amherstburg to Chicago, and the Michigan Midland, from St. Clair to Holly, Fentonville and westward—are getting themselves in shape for rapid completion, and their managers are confident that they will be ready as soon as we are. With our line and the Canada Southern & Chicago completed, Chicago will have a line to Buffalo 480 miles in length, with no grade over 15ft. to the mile, and the shortest line that can be built. This is saying enough for it."

Connecticut Western.

It is reported that this company has leased the Dutchess & Columbia Railroad, and that it will run its trains from Hartford through to the Hudson at Dutchess Junction.

Newburyport & Amesbury Horse Railroad.

Col. John E. Gowen, of Boston, has contracted to build the Newburyport & Amesbury horse railroad for $50,000, and takes $20,000 of the stock of the road.

Fitchburg Railroad.

At a recent meeting of the stockholders of the Fitchburg Railroad Company, in Boston, it was voted to unite with the Worcester & Nashua Railroad Company in a lease of the contemplated Lancaster road, and to construct a branch from this road to the main branch at Concord.

Sugar River Railroad.

This New Hampshire railroad is completed to East Newport.

Bangor & Piscataquis.

An extension of this railroad from Foxcroft to Guilford, Me., was formally opened on the 14th inst.

Kennebec & Wiscassett.

A survey for this projected railroad in Maine is progressing under the direction of Col. A. W. Wilder.

European & North American.

This company has recently made a final settlement with Brooks, Gordon & Ryan, the contractors for the 56 miles between Mattawamkeag and Vanceboro', whose account amounted to nearly a million.

Cazenovia & Canastota.

This short road, an enterprise of three towns of moderate size and limited means, has been running about one year, and now possesses a well-ballasted track. A correspondent gives us the following description of it: "Few branch lines have overcome equal engineering difficulties, or are as well and permanently built. Starting from the Erie Canal and New York Central at Canastota, it seeks a devious route southward, and in nine miles mounts the range of table land that, with but few breaks, extends from the Hudson to the lakes. This elevation is about 700 feet above the canal, and commands superb views, overlooking Oneida Lake, and far toward Ontario.

"The line was laid by John B. Jervis, the eminent engineer, and represents his idea of a surface line, following the contour of a rough country, often too closely, rendering detail changes (already made) necessary. At one point it is carried over a mile on the side of a precipice, in a rock side-cut, three hundred feet above the valley, making a timid traveler glad to know that the track is on the solid rock. All the details of the road are permanent, all bridges iron and stone, and all rolling stock provided with housing at the terminus at Cazenovia. As a model branch line it invites the attention of men who understand and appreciate good work, where permanence and safety are mainly considered."

Syracuse & Chenango Valley.

This road, writes a subscriber, will soon run regular trains to a point 17 miles from the city, three miles from Cazenovia. Here the track-laying will be arrested until the completion of the tunnel which carries the road from the valley of the Limestone to the shore of Cazenovia Lake. This work is a heavy one, being a tunnel of 1,600 feet, reached through deep rock cuts. It is cut through a slate rock, seemingly firm, but exposure so decomposes it that arching will be required to render it safe. This, added to the rock work, will make a slow and costly work. Headings are now in perhaps 1,000 feet.

Virginia Valley Railroad.

This project of the Baltimore & Ohio Company for the construction of a line up the Shenandoah Valley and across to the Virginia & Tennessee Railroad now seems likely to be realized soon. The city of Baltimore has made its subscription of $1,000,000, which was conditioned on the subscription of $1,200,000 by the towns and counties in Virginia along the line. These subscriptions are as follows: Rockbridge County, $525,000; Botetourt County, $200,000; Roanoke County, $200,000; city of Staunton, $150,000; town of Lexington, $30,000; individuals, $95,000—making the total of $1,200,000. The Baltimore & Ohio Railroad Company has also subscribed $1,000,000. This provides a capital of $3,200,000 to begin with. Two lines have been surveyed between Harrisonburg (the present terminus of the Baltimore & Ohio's line) and Staunton, and two corps are surveying south of Staunton. The road will be about 116 miles long.

Buffalo Junction Railroad.

This is a railroad seven miles in length extending around the city of Buffalo, from the East Buffalo stockyards to a point on the Niagara Falls road a little above Lower Black Rock, and connecting all the railroads which enter the city. Trains commenced running regularly over this road on the 13th inst.

Western Maryland.

The track of the extension is completed nearly to Smithsburg, and is expected to reach Hagerstown as early as Christmas

A Kentucky Narrow-Gauge Railroad.

It is reported that the Ceredo Mineral Company is engaged in the construction of a narrow-gauge (three feet three inches) railroad from Ceredo (two miles east of Catlettsburg, Ky.,) into the interior, designing to carry it into the coal, iron and timber belt that lies within the drainage of the Big Sandy and Licking rivers.

Knoxville & Kentucky.

A Kentucky paper reports that "It is the intention of the Tennessee company which recently purchased the State's interest in the Knoxville & Kentucky Railroad to push the enterprise forward to early completion. It is believed that no difficulty of a serious nature will be encountered in securing from Kentucky the proper legislation to make this a through route. It is confidently believed that, by the opening of spring, the entire line can be placed under contract." This will connect with a line of the Louisville & Nashville, completing a route to Knoxville, which probably at some time will form part of a pretty direct line from Louisville to Charleston, S. C.

Western North Carolina.

The Asheville (N. C.) *Citizen* says that arrangements have been made for the extension of this railroad westward across the mountains to the Tennessee line, there to connect with the Morristown Branch of the East Tennessee & Georgia road, opening a very direct route to Knoxville.

Wadesboro & Salisbury.

This company, recently organized in Delaware to construct a railroad between the two places named in its title, has placed all its stock and organized in such condition that it is thought the road will be speedily built.

Mississippi River Railroad.

This company, it had been announced, was certainly to be consolidated with the Paducah & Gulf, but at recent joint meetings of the two companies, held for the purpose of consolidating, the Paducah & Gulf declined. Another meeting is to be held December 1.

Cumberland & Ohio.

The Committee on Railroads has reported to the Louisville City Council in favor of subscribing $1,200,000 to the Cumberland & Ohio Railroad, on condition that the name be changed to Louisville, Cumberland & Chattanooga Railroad; the company to raise $3,000,000 outside of Louisville; the road from Louisville to Chattanooga to be the main trunk line; the principal shops and offices to be located there; five directors to be citizens of Louisville, and designating the part of the road upon which the city's money is to be spent. The question has been reserved for consideration.

Edgefield & Kentucky.

This railroad, which extends from Nashville north to the Kentucky line, forming the Tennessee part of the line from Henderson to Nashville, was sold on the 9th inst. to the American Contract Company, which leases and operates the Kentucky part of that line, *i. e.*, the Evansville, Henderson & Nashville Railroad, so that now the line from the Ohio River to Nashville is under one management, which is the more important now that a continuous line is opened from Chicago to Evansville.

Lake Shore & Tuscarawas Valley.

This railroad was completed early this month from Cleveland southward to Medina, Ohio, about 30 miles, and by this time was to reach Seville, about 12 miles further—a station on the Atlantic & Great Western Railroad. This road will serve a considerable territory heretofore without an outlet by rail.

Lafayette, Bloomington & Mississippi.

On the 17th inst., the contractors, Snell, Taylor & Co., of Chicago, had completed this railroad from Bloomington as far east as Gibson, and were pushing it forward rapidly.

Monroe, Wayne & Holly.

This line is now nearly completed, the part between Holly and Wayne having been finished a few weeks ago, and that between Wayne and Monroe being now nearly completed.

Ashtabula, Youngstown & Pittsburgh.

This new Ohio railroad is nearly ready for the superstructure. It will extend from Ashtabula, on Lake Erie, near the northeast corner of Ohio, nearly due south to Youngstown, about 50 miles.

Houston & Texas Central.

This company has commenced the construction of a branch to Waco.

Toledo, Tiffin & Mansfield,

The Toledo *Commercial* of the 9th says: "We heard yesterday from Tiffin that the road-bed of the Toledo, Tiffin & Mansfield road is so nearly completed that the line between Toledo and Mansfield will be ready for the iron within thirty days. President Scott, of the Pennsylvania Company, says track-laying will commence as soon as the bed is ready for it, and will be prosecuted with energy. This work will probably commence at Mansfield, at which point the iron will be delivered. It is now expected that the entire line will be open for business by the early spring."

This road will furnish to the Fort Wayne road a branch to Toledo, which ought to be of great value to both city and railroad.

Lafayette, Muncie & Bloomington.

Snell, Taylor & Co., the contractors for the grading and bridging of this road, say that they will have it all completed by December 15.

Gilman, Clinton & Springfield.

This new Illinois railroad, which is 110 miles long, was opened for regular business last week. It is a feeder of the Columbus, Chicago & Indiana Central system, and is controlled by the Pennsylvania Railroad Company.

Illinois Farmers' Railroad.

This railroad, for some months in operation from Jacksonville, Ill., southeast 18 miles to Waverly, is now about completed to a connection with the Chicago & Alton Railroad at Virden, 12 miles farther southeast.

It is reported that this company and the Jacksonville, Northwestern & Southeastern will be consolidated.

Chicago & Canada Southern.

The first section of this railroad from Morenci to Blissfield, Mich., is nearly ready for the iron. The company is considering a project to construct a branch from Morenci southeast to Toledo.

Chicago & Michigan Lake Shore.

W. F. Thompson has the contract for the construction of the extension of this railroad from Montague northward to Pentwater, Mich., and is to have it completed and ready for trains by the 1st of January.

Toledo, Wabash & Western.

During the week ending November 14 this railroad did a heavier freight business than ever before. There were 1,158 cars which passed eastward through Danville, Ill., and on the 14th there were eleven freight trains in that direction, with 245 cars.

Pekin & Mississippi.

A line is projected under this name, to extend from Pekin, Ill., westward to the Mississippi, opposite Fort Madison, Iowa. The President, Mr. H. W. Kreider, of Prairie City, Ill., is now trying to secure sufficient subscriptions from those living along the proposed line to make it possible to let the contract for the section between Pekin and Prairie City.

Wisconsin Central.

A Wisconsin paper says:

"As soon as the Wisconsin Central reaches Stevens Point, which will be very soon, a regular passenger train will be put upon the road, starting from Menasha at 8 o'clock a. m., and making direct communication with the Chicago and Northwestern trains. The train will be run at the rate of over 15 miles per hour, reaching the Point at 12 m. Mr. Colby and others of the capitalists interested in the road, have been over it lately, and, among other things, contracted for a depot at Waupacca. Some handsome new engines and cars have been put on."

Milwaukee & Northern.

This company has made arrangements with the Sheboygan & Fond du Lac road for running through trains, passenger and freight, to Fond du Lac, with direct connection at Plymouth for Sheboygan. The road will be finished to Plymouth, the point of junction with the road from Sheboygan to Fond du Lac, by the first of December.

Mineral Point Railroad.

Engineers are making the survey for an extension of this railroad northward from Mineral Point to Tomah, Wisconsin.

Minneapolis & St. Louis.

This railroad was completed on the 16th inst. to a connection with the St. Paul & Sioux City Railroad, 30 miles southwest of Minneapolis. This road is to be extended 90 miles south of the present terminus to a connection with the northern end of the Central Railroad of Iowa at the Iowa line.

St. Paul, Stillwater & Taylor's Falls.

The grading of this railroad is very nearly completed from St. Paul northwest to Stillwater, on the St. Croix, a distance of 18 miles. Though the ground was very difficult, the line has been made with very few curves and with no grades exceeding 60 feet to the mile, which, however, is no light grade. The company consists of St. Paul capitalists. Through this line the West Wisconsin will enter St. Paul, after crossing the St. Croix at Hudson, and it is also intended to make it the St. Paul entrance of the proposed line to Bayfield, on Lake Superior, 20 miles of which is under contract.

Burlington & Missouri River.

This railroad has been making an important branch this season, about which very little has been said. This is a line from Creston, Iowa, 190 miles west of Burlington, southwest 40 miles to Hopkins, the present northern terminus of the Maryville Branch of the Kansas City, St. Joseph & Council Bluffs Railroad, on the Missouri line. This branch extends due south to St. Joseph, 61 miles, and it, in connection with the other roads named and the Chicago, Burlington & Quincy, will form a new route from Chicago to St. Joseph, 498 miles long, which is only 29 miles longer than the present route by way of Quincy and the Hannibal & St. Joseph Railroad. It will, too, afford a route to Atchison 518 miles long, to Leavenworth 543 miles, and to Kansas City 568 miles long, all over lines harmoniously managed—in short, all "Joy" roads. The whole of the grading of the branch which will complete this line is done, and half of the track was to be laid early this month, when it was promised that trains should be running by the 1st of December. Without any through traffic the line should be valuable.

The sales of Burlington & Missouri River Railroad lands in Iowa, during the month of October, 1871, were 287 83-100 acres, at an average price of $11.83¼ per acre, amounting to $33,985.55.

Louisiana & Missouri River.

The track of the Southern Branch of this railroad (Mexico to Jefferson City, Mo.) reached Callaway county two weeks ago, and is expected to reach the Missouri early in December.

Brownsville & Fort Kearney.

A considerable amount of grading is completed on this Nebraska railroad, and iron for ten miles has arrived in St. Louis, and part of it in Brownsville, and track-laying is commenced.

Flint & Pere Marquette.

The first train of cars on this road to reach Hersey, four miles east of the junction with the Grand Rapids & Indiana Railroad, arrived November 8.

Cape Girardeau & State Line.

The first installment of 6,000 tons of iron for this road was due at New Orleans on the 1st, and is expected to arrive at Cape Girardeau, Mo., by the 1st of December. The Cape Girardeau *Argus* says the cars will be running to the Iron Mountain road by the 1st of January. It is intended to connect at the Arkansas line, 87 miles from Cape Girardeau, with the Cairo & Fulton road.

Lexington & St. Louis.

This railroad, which is to form a branch of the Missouri Pacific Railroad from Sedalia northwest to the Missouri River at Lexington, has been for three weeks in operation between Sedalia and Brownsville, 20 miles.

Missouri, Kansas & Texas.

Under the charter of the Tebo & Neosho Railroad Company, from which the Missouri, Kansas & Texas obtained its Sedalia & Fort Scott line, the latter company has made a contract to construct an extension from Sedalia northwest *via* Boonville on the Missouri to Moberly on the North Missouri Railroad. This will give the Missouri, Kansas & Texas connections with the North Missouri for St. Louis, the Louisiana & Missouri River for Chicago, and the Toledo, Wabash & Western for the East. The contract requires the completion of the road within eighteen months. The line will be seventy miles long. The Missouri River will be crossed by a ferry until a bridge is constructed.

Manhattan & Northwestern.

This company's project is to construct a railroad from Manhattan, Kansas, northward up the Big Blue to the Nebraska line, where the Omaha & Southwestern will meet it; and also a branch crossing to the Republican River and up it to the Nebraska line, about 75 miles further west.

Manhattan & Southwestern.

This company, which is acting entirely in harmony with the Manhattan & Northwestern, intends to construct a railroad from Manhattan, Kansas, southward to a connection with the Missouri, Kansas & Texas Railway.

Central Branch Union Pacific.

This railroad, which was completed to Waterville, 100 miles west of Atchison, some years ago, is to be extended immediately, and orders have been given for the letting of contracts for grading 20 miles.

Memphis, Carthage & Northwestern.

Mr. J. B. Polley, the Chief Engineer, writes as follows from Carthage, Mo., on the 11th inst.. "There are at present some 600 men working on the first division of 26 miles between Carthage and Pierce City. There we connect with the Atlantic & Pacific for St. Louis. Extending west of Carthage we pass through Columbus Crossing of the Missouri River, Fort Scott & Gulf, Oswego Crossing of Missouri, Kansas & Texas, Independence Crossing of Leavenworth, Lawrence & Galveston, and west through the southern tier of counties in Kansas. This will open up an east and west road through the finest agricultural and mineral region of Missouri and Kansas."

Vicksburg, Deer Creek, Helena & Memphis.

The contractors, Goodhue & Shover, commenced the grading of this railroad at a point on the Yazoo River, opposite Snyder's Bluff, November 6. An effort will be made to complete 50 miles of the road by September 1, 1872. Gen. Wirt Adams, of Vicksburg, is President.

Girard, Erie & New Chicago.

A survey has been made for this proposed new Kansas road, and it is said that it can be very cheaply built.

Brunswick & Albany.

This railroad, which is one of a considerable system in Georgia, extending from the sea-coast westward across the State, was just completed to Albany, 172 miles from Brunswick, when its President, H. I. Kimball, of Atlanta, became involved financially and work was suspended. It was under contract from Albany westward to Eufaula, Ala., where it was to connect with the Brunswick & Vicksburg road, a considerable section of which has been built this season. It has been reported that Governor Bullock, of Georgia, had issued to the company bonds for the part of the road uncompleted. Concerning this, the Albany (Ga.) *News* says:

"Whether Mr. Kimball has received more bonds than the number of miles of completed road calls for, as currently reported and generally believed, we have no means of knowing, and care but little, as that is Bullock's and the bondholders' quarrel—not ours. We believe Mr. Kimball intended in good faith to accomplish all he undertook, and had no thought of overreaching Bullock or of plundering Georgia. Till the contrary is clearly shown we shall give no credence to defamatory rumors, and entertain no suspicion of his complicity with schemes to rob our people."

Early this month the managers of this road commenced running tri-weekly trains between Brunswick and Albany.

New Orleans, Mobile & Texas.

The engineers and agents of this company have made a survey of the entire line of the branch from Vermillionville northwest to Shreveport, which is to connect with the Texas Pacific Railroad, and have located most of the stations. It is reported that this branch will be made of narrower gauge than the main line, which, we believe, is of 5 feet gauge, but this is likely to be determined, or at least influenced, by the gauge to be adopted for the Texas Pacific.

Port Royal & Augusta.

There is now completed 40 miles of this new South Carolina railroad, extending from Port Royal northwestward, and trains run regularly from Port Royal to connect with the Charleston & Savannah Railroad for Charleston and Savannah.

Atchison, Topeka & Santa Fe.

Mr. Ellenwood, the company's engineer, has completed a preliminary survey for the extension of this railroad across Indian Territory and as far as Fort Union, New Mexico. He hopes to continue the survey this season as far as Pueblo, New Mexico.

St. Joseph & Denver.

Work has been commenced at the 160th mile-post on the extension of this railroad towards Fort Kearney, that mile-post being eight miles west of Fairbury, Neb.

Portland & Salt Lake.

Portland, Oregon, people are asking Congress for aid for a railroad from that city to Salt Lake, Utah, a distance of a thousand miles or more, for much of the way through mountains.

Central Pacific.

This company is now sending through trains to Vallejo, the terminus of the California Pacific, which it has lately leased. This gives by far the shortest route from Sacramento to San Francisco. The first through train reached Vallejo November 5.

Northern Pacific.

The St. Paul *Press* of the 12th says: "Colonel John S. Loomis returned last evening from Dakota Territory direct, where he has been spending some months in the interest of the Northern Pacific Railroad, of which company he is the Land Commissioner. Work is being pushed forward with unabated vigor from Red River to the Cheyenne, and the grading for fifty miles will be accomplished within a few weeks. There is to be no let-up whatever in the construction of this gigantic continental railway, and in order to facilitate progress, the company officials and contractors are going into snug winter quarters on the Cheyenne and James rivers and other points, where they will be furnished with all needed supplies, in order that work can be pushed ahead during the winter, whenever the weather is at all favorable for the purpose. Contracts have been let all the way to the Missouri, near Fort Rice, which point will be reached during next summer."

Denver & Salt Lake.

Under this name a company has been organized in Colorado, which proposes to construct a narrow-gauge railroad from Denver along the South Platte to the Middle Fork, thence by the most feasible route to Salt Lake. It is said that this route is through the best timbered region of the Rocky Mountains, and it is believed will shorten the distance from Denver to Salt Lake two hundred miles. Its corporators are W. S. Jackson, C. B. Lamborn and R. C. Hunt.

St. Paul & Pacific.

The citizens of St. Cloud have at last agreed upon the location of the railroad bridge at that point, which will be near the northerly limits of the city. Twenty acres within the city limits are also donated to the St. Paul & Pacific Railroad Company, together with $65,000 in bonds. This result was announced in detail to Mr. Becker, President of the road, who at once replied by telegraph that the proposition was satisfactory, and the company would faithfully carry out the plan.

Wells, Fargo & Co.'s Express.

From the Denver *News* we learn that this express is to run on the Denver & Rio Grande and the Denver & Boulder Valley road. It has for some time run on the Kansas Pacific and on nearly all the railroad and stage routes of the Pacific coast.

Northern & Southern West Virginia.

This company purposes to construct a railroad from Pittsburgh southward to Charleston, W. Va., on the line of the Chesapeake & Ohio. It is reported that the Pennsylvania Railroad Company will assist it if it will secure a certain amount of aid from the counties on the line.

Southern Kansas Railroad.

A Kansas paper reports that the line of this railroad between Cherryvale and Independence is under contract and thronged with workmen the whole distance. It is expected that the cars will run to Independence by the 15th of December.

Toronto, Grey & Bruce.

This Canadian narrow-gauge railroad was opened to Orangeville, 48 miles from Toronto, on the 3d inst. The county of Grey has voted $300,000 in aid of the extension of the road to Owen's Sound, and it is thought that the line may be completed to that place before the end of next year.

Kansas Central.

Clay county, Kansas, has voted to subscribe $250,000 to this road, and at the same time voted against a proposition to subscribe $200,000 to the Junction City & Fort Kearney Railroad.

Walla Walla & Columbia.

This Oregon company proposes to construct a narrow-gauge railroad from Walla Walla to Wallula.

Virginia & Truckee.

An extension of this railroad from Reno to Steamboat Springs, Nevada, 12 miles, was opened on the 7th inst.

Peoria & Rock Island.

At the recent annual meeting of this company, the President, Dr. W. R. Hamilton, gave a general report of the year's operations, of the most important part of which the following is a summary:

The receipts from all sources the past year were—

From sale of bonds	$130,719 60
From loans	69,562 70
From individual subscriptions	5,516 50
Total	$205,798 80

The individual subscriptions received were mostly in notes payable January 1, 1872, and are still held by the company. The amount of cash actually received was $200,282.37. This has all been paid out, and the company are still owing:

Boyington & Rust	$21,000 00
Prescott & Jameson (about)	7,000 00
French & Davis, Davenport	4,500 00
Total owing contractors	$32,500 00

There is now due the company from the township of Akron about $34,000, and from citizens of Davenport about $15,000. These subscriptions are in litigation, but President Hamilton expressed full confidence in their collection.

The road has been ironed and all the rolling stock furnished by Benj. E. Smith, as agreed. The traffic since the road has been opened to the public has been most gratifying. The passenger traffic has been quite satisfactory, fully equal to anticipations, and the freight traffic greatly in advance. The road has done all that its limited means would allow, and could have done many times the amount had they possessed the rolling stock. One hundred new freight cars have been ordered by Mr. Smith for the road, who will loan them to the company until such time as it can purchase them.

Hannibal & St. Joseph.

In reply to a question concerning the intentions of the new directors of this company, Mr. B. F. Carver, the new Vice-President, answered a representative of the Quincy (Ill.) *Whig*, that he was much pleased with all the present arrangements; that the citizens of Quincy *may rest assured* that no change would be made in the present running arrangements with the Chicago, Burlington & Quincy Railroad; that investigation had convinced him that these arrangements were more than just to the Hannibal & St. Joseph Railroad; that they were receiving far the largest share in the pro-rating of through business; that it would be perfect folly to think of cutting loose from the Chicago, Burlington & Quincy Railroad, and that any such policy would be disastrous to the Hannibal & St. Joseph's interests; that they had no interest pecuniarily in Quincy or Hannibal, and would not run the road in the particular interest of either place, but to make money for the stockholders.

Mr. Carver also said that the company would have to spend a million of dollars in reducing grades and other improvements of the road, in order to make it as profitable as it should be.

Sunbury & Lewistown.

This railroad was finally completed on the 1st inst. It extends from Elins' Grove, Pa., on the Northern Central Railway 28 miles north of Harrisburg and five miles south of Sunbury, southwest fifty miles to Lewistown, on the Pennsylvania Railroad 61 miles northwest of Harrisburg. It is admirably located as a western outlet of the Mahanoy & Shamokin, the Danville, Hazleton & Wilkesbarre, and other railroads which penetrate the anthracite regions. There was at one time a project to operate it in connection with one of these railroads and another across New Jersey as a link in a line from the West to New York; but as the Sunbury & Lewistown (organized as the Middle Creek Railroad), has been leased by the Pennsylvania, it is not now likely to be used for such a purpose.

Gulf, Western Texas & Pacific.

This is the title of a corporation formed by the consolidation of San Antonio & Mexican Gulf and the Indianola railroad companies, which, at the time of consolidation, were owned by Henry S. McComb and Charles Morgan. This company is now soliciting local subscriptions to enable it to extend its line.

St. Louis & Keokuk.

The Louisiana *Journal* reports that a contract has been let for the construction of this railroad from Hannibal, Mo., southward to St. Charles, and that grading is to be commenced December 1. Louisiana is made a point on the line instead of Bowling Green.

Pike County Short Line.

This company has 28 miles of line surveyed, and, says the Louisiana *Journal*, "on the 16th of October last the greater portion of the line from Bowling Green south to the Pike line was let to contract, Frier & Penn getting the first three miles south from Bowling Green. The fourth mile was let to J. H. Shepherd, the fifth to Alex. Birkhead, the sixth and seventh to Williamson Shaw and John McCune, the thirteenth and fourteenth to James Blair, J. T. Blair and James Thrail. The eighth, ninth, tenth, eleventh and twelfth miles were not let. The prices for the work is less than 17c."

Missouri, Iowa & Nebraska.

This railroad is now completed from Alexandria, in the northeast corner of Missouri, westward to Memphis, Scotland County, and a large force is working between Memphis and Lancaster, to which latter place, with favorable weather, the track will be laid by the middle of December. The company has purchased cars in Wilmington, Del., and is constructing machine shops in Alexandria. All the culverts are of stone and all the bridges of piles.

Quincy, Missouri & Pacific.

At their recent quarterly meeting, the directors of this company made a trip over the completed portion of the road, which was 18 miles long. The Mississippi bluffs are ascended by a grade of 66 feet per mile.

Cairo & St. Louis.

From the St. Louis *Republican* we learn that the grading of this narrow-gauge line is completed from a point opposite Carondelet southward to Columbia, Ill., and that a large force is now grading between Columbia and the Randolph county line, and also another party north of Cairo. Twelve miles was ready for the superstructure a week ago. H. R. Payson, one of the contractors, is purchasing iron in Europe, which is to arrive next February, and fifty miles of the road, from St. Louis to Sparta, is to be open in May, and thirty miles more, to Murphysboro, in July.

Philadelphia, Wilmington & Baltimore.

Says the Philadelphia *Press* of the 11th inst.:

"On the 11th instant the Philadelphia & Trenton Railroad Company voted in favor of a lease to the Pennsylvania Railroad Company. Through an inaccurate report, many journals have it the Philadelphia & Wilmington. Although by railroad men this mistake would be instantly seen, still, at a distance and by the general community, it would easily be accepted, and prove in many ways annoying. We have the best authority for saying that there is no ground for any report of either the lease or sale of the Philadelphia, Wilmington & Baltimore Railroad at present to any party."

Locating a Union Depot by Law.

Says the Springfield (Mass.) *Republican* of the 15th inst.:

"The report of the commissioners appointed by the Supreme Judicial Court to determine upon which of two sites the proposed union passenger depot at Worcester shall be located was submitted to Judge Wells of the Supreme Court at Boston, Tuesday. The commissioners reported in favor of the present site of the Boston & Albany passenger depot, east of Grafton street, in which they are sustained by the city of Worcester, the Boston & Albany and the Boston, Barre & Gardner railroad companies. The opponents to the location are the Worcester & Nashua, Providence & Worcester and Norwich & Worcester railroad corporations. A hearing of the different parties was held for the purpose of determining whether the report should be affirmed by the Supreme Court. A motion was made to vacate the whole proceedings of the commissioners on the ground that the Boston, Hartford & Erie Railroad, which was a party in interest as lessees of the Norwich & Worcester road, were neither consulted when the commissioners were appointed, nor heard before the commissioners. The report was also objected to as unconstitutional, because it requires several existing railroads to build new tracks beyond their present termini. These points were argued by counsel, and Judge Wells will prepare a written report, which he will submit to the full bench for argument on the 23d inst."

New Haven & Northampton.

This company on the 15th inst. opened its new branch from Westfield to Holyoke, Mass., 10 miles long.

Philadelphia, Delaware & Chester Central.

This company intend building a railroad from Philadelphia *via* Newton Square to West Chester and thence to Downingtown. They have elected the following officers and directors:

Tryon Lewis, President; William T. Sharpless, William Evans, Enos Williamson, John M. Pomeroy, Louis D. Baugh, A. K. McClure, George K. Anderson, Robert Johnson, William Elliott, William H. Armstrong, Joseph H. McKeehan, Howard L. Sloan.

Engineers will be placed upon the line within a few days. The road will be of narrow gauge.—*Philadelphia Press.*

Des Moines Valley.

The Des Moines *Register* is informed by John A. Elliott, Land Commissioner of the company, that the Des Moines Valley road has within the last six weeks sold over two million dollars' worth of their lands in Northwestern Iowa. They were mainly sold to the parties who hold the first-mortgage bonds on the road. The prices paid ranged from $5.20 to $20 per acre.

Mississippi & Tennessee.

Says the Memphis *Avalanche* of the 11th inst.:

"In the Second Chancery Court yesterday, Chancellor Scott dissolved the injunction restraining H. McComb and the Southern Association 'from selling, voting or otherwise disposing of $250,000 of the stock of the Mississippi & Tennessee Railroad.' This injunction was granted some time since at the instance of the city, and by its dissolution, McComb & Co. gain the controlling interest in the road, and will, at the next election, be able to put in their own officers."

This gives the Southern Railroad Association complete control of an unbroken line from New Orleans to Memphis.

Connecticut River Railroad.

The directors of the Connecticut River Railroad held a meeting in Springfield, Mass., November 9. The total income of the road for the last year, from passengers, freight and mail and express service, was shown to be $725,000; the expenses $477,000; the net profits $248,000. The new branch from Mount Tom station to Easthampton is so nearly completed that a locomotive passed over the entire length on Tuesday evening. Trains were to be run regularly by this time.

Arkansas Central.

Mr. S. W. Dorsey, the President, writes that his road will be completed from Helena to Little Rock and to Pine Bluffs by next July, and that immediately thereafter it is intended to commence work on the Pine Bluff & Southwestern, from Pine Bluff, Ark., southwest to Shreveport, La., which is intended as an outlet of the Texas Pacific.

English Light Cars for Railroads of Different Gauges.

An English paper gives the following description of some light cars designed by Mr. Fairlie recently constructed in Bristol:

"The light rolling-stock is being made at the shops of the Bristol Wagon Company; and the specimens exhibited were for three different gauges, one of 4ft. 8½in. (the prevailing gauge of this country and of Europe), one of 3ft. 6in., and one of 2ft. 6in. The 3ft. 6in. stock has been made for the Dunedin & Port Chalmers Railway, and the 2ft. 6in. stock for a railway in Peru, it being intended that both lines should be worked entirely with Mr. Fairlie's carriages and engines, and upon the system for which he has so long contended.

The whole of the stock furnished ample evidence how little the capacity of carriages and wagons need be diminished by even a considerable reduction in gauge. The light wagons for the 4ft. 8½in., or ordinary narrow gauge, are 14 feet long and 7ft. wide by inside measurement. Their sides are 2ft. 6in. high, they weigh 2 tons 5 cwt., and will carry seven tons. If fitted with a patent break, their weight will be increased to 2 tons 7 cwt. The 3ft. 6in. wagons are six inches longer than the foregoing, and of the same dimensions in all other respects. They weigh about 2 tons 2 cwt., and will carry seven tons. The 2ft. 6in. wagons are 6 feet wide by 12 feet long, and 2ft. 6in. deep; they weigh 1 ton 11 cwt., and will carry five tons.

"The passenger carriages for the 3ft. 6in. gauge are commodious. A first-class carriage is 19ft. 6in. long, and 7ft. 6in. wide. It is divided into three equal compartments, each with seats for eight persons, and the height from floor to roof in the center is 6ft. 8 in. The roof is lined over the seats with thin mahogany, and over the center with bird's-eye maple, and the lamp is wholly above the roof level, countersunk, so to speak, within a polished reflector, calculated to light up the whole interior and to render reading possible. The general trimmings and decorations of the interior are very tasteful and pretty. The second-class carriage is 18ft. 6in. in length, but of the same width and height as the first-class, and divided in the same manner, although each of its three compartments will accommodate ten persons. The weight of the first-class carriage is 300lb., and that of the second-class carriage 232lb., for each seat; so that, if this stock can only be filled, the ordinary proportion between dead and paying weight in a passenger train will be very materially modified. The covered goods wagons for the same gauge are 14ft. 6in. long, 7 feet wide, 6 feet high, and weigh 2 tons 15 cwt.

"The chief difficulty in the way of designing a light railway stock is the amount of solid material that has hitherto been thought necessary in order to give sufficient strength to resist the shocks and concussions incidental to the daily workings of a line. In ordinary wagons, for example, the buffers are only the sides of the frame prolonged, and every time these buffers meet the whole of the frame is rudely strained and shaken. That which may thus be seen to happen at any station when a goods train is being shunted happens also, although in less degree, with passenger carriages; and the great strength, of which great weight is the necessary consequence, has been required as a protection against sudden contacts, and in order to prevent the stock from being shaken to pieces by the jars to which it must be subjected. As a first step toward lightness, Mr. Fairlie has aimed at diminishing concussions, and for this purpose he has introduced a new system of buffers and of coupling. Beneath the frame of each carriage there runs an iron drawbar, and the drawbars of adjacent carriages are closely coupled by a single link. Every carriage is furnished at both ends with a single central buffer, presenting a convex surface, and these buffers are brought almost into contact. Each buffer is furnished with a strong coiled spring, and has about an inch of play, the general result being that the closeness of the coupling and the continuity of the drawbar render the train of carriages movable as a single mass, and not as a succession of detached portions, which may be knocked about almost independently of each other. The passage of the united train round curves is provided for in the mode of attachment of the drawbar under each carriage, and the closeness of the coupling has rendered necessary a total departure from the ordinary mode of fastening, by which so many railway servants have been killed and injured. In the new carriages the drawbar terminates in a sort of expanding cup or receptacle, comparable to a funnel, only square instead of circular. Through the sides of this receptacle a horizontal bolt passes, and can be moved in or out by a lever and bell crank working from about the middle of the carriage. When two carriages are to be joined, a single iron link about 8 inches in length is put into the receptacle of one of them and the bolt is shot through it. The carriage, with the link projecting, is moved up to its yokefellow, and the free end of the link enters the receptacle of the second carriage, where it also is secured by shooting the horizontal bolt. The fastening is effected instantaneously, by a single movement of the lever, as the carriages come into position, and is not only much more expeditious than the present system, but seems to be absolutely free from danger to those who are concerned in carrying it out. If these plans are found to work in actual practice as well as they do in experimental trials, the new buffers and couples will not only save enormous expenditure in the conveyance of dead weight, but they will also save many valuable lives. Every coroner is aware that the trapping of a railway servant between buffers is a matter of no uncommon occurrence.

"An incidental advantage of the traction from a central point is that a narrow line might be laid down inside one of broader gauge, and that an engine running upon either would draw a composite train made up of carriages, some of which were wide and some narrow. In the shops of the Wagon Company, at Bristol, the three gauges were thus laid down in one track, and such an arrangement might offer many facilities for connecting cheap narrow-gauge branches with a trunk line constructed upon a larger scale."